

# ARAVIND EYE CARE SYSTEM

*Vision: Eliminate needless blindness*



## activity report

*April 2019 to March 2020*

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*Special thanks to Terry Cooper, photo journalist from London, UK.*

*Several photos taken by him during his visit to Aravind in February 2020 are used on the cover and in the pages inside.*

## activity report

*April 2019 to March 2020*



## Be the change ...

"In our early days, Gandhiji was all in all for us,  
He was not for renouncing the world to seek the Divine.  
Rather, he was for living and transforming life to reach the Divine."  
- Dr. G. Venkataswamy



*'Knowing Gandhi' was an event organised at Aravind to celebrate the 150th Birth Anniversary of Mahatma Gandhi. The tableau here, put up by the staff depicts Gandhiji fasting in the Sabarmathi Ashram.*

*To Gandhiji, fasting was a potent weapon in the Satyagraha armoury. With infinite patience, firm resolve, single-mindedness of purpose, and perfect calm, he stood for what is right.*

*In the global effort to eliminate needless blindness, Dr. V saw the need for such resolve and determination.*





*What I am really talking about is spiritualism. Spiritualism is a progressive awakening to the inner reality of our being, to a spirit, a self, a soul that is something other than our mind, body, and life. Spirit is an inner aspiration to know, to enter into contact and union with the greater reality beyond, a reality that also pervades the universe and dwells in us. As a result of that aspiration, contact and union, there is a conversion, a turning, a birth into a new being.*

*Spiritualism is the antidote to our present crisis. The scientific pursuit, in its cold and even way, has made discoveries that have served practical humanitarianism on one side and on the other side has supplied monstrous weapons to egoism and mutual destruction. With our mass communications systems, a materialistic culture spreads rapidly all over the world and younger generations now think that material existence is the only reality.*

*Sri Aurobindo said that the turmoil and disorder of the world need to be replaced by a commitment to the power of a higher, truer consciousness. "One must make a leap forward," he wrote.*

*Sri Aurobindo's essential method was to try to quiet and calm the mind. Then it could face both good and bad with equanimity.*

*- 'Illuminated Spirit' - Dr. G. Venkataswamy  
Wit Lectures, Harvard University, The Divinity School*

*\* The symbols above represent the spirituality of the Mother and Sri Aurobindo respectively.*



# ARAVIND EYE CARE SYSTEM

*Vision: Eliminate needless blindness..*



## EYE CARE SERVICES

*.. by providing compassionate and quality eye care affordable to all*



## EDUCATION AND TRAINING

*.. by developing ophthalmic human resources through teaching and training*



## RESEARCH

*.. by providing evidence through research and evolving methods to translate existing evidence and knowledge into effective action*



## CONSULTANCY AND CAPACITY BUILDING

*.. by enhancing eye care through capacity building, advocacy, research and publications*



## OPHTHALMIC SUPPLIES AND EQUIPMENT

*.. by making quality ophthalmic products affordable and accessible to the vision impaired worldwide*

## EYE CARE SERVICES

### ARAVIND EYE HOSPITALS

Tertiary Eye Care Centres - 7  
(Speciality care, Research & Training)

Madurai 1976  
Tirunelveli 1988  
Coimbatore 1997  
Pondicherry 2003  
Salem 2011  
Chennai 2017  
Tirupati 2019

Secondary Eye Care Centres - 7  
(Cataract services, Speciality diagnosis)

Theni 1985  
Tirupur 2010  
Dindigul 2010  
Tuticorin 2012  
Udumalpet 2012  
Coimbatore City Centre 2014  
Kovilpatti 2019

### OUTREACH PROGRAMMES

#### Free Eye Camps

Community Eye Clinics - 6  
(Out-patient eye care centres for comprehensive eye examination, treatment of minor ailments)

Melur 2004  
Tirumangalam 2005  
Cumbum 2008  
Madurai City Centre 2009  
Sankarankovil 2010  
Pondicherry City Centre 2011

Vision Centres - 79  
(Primary eye care centres for comprehensive eye examination)

### ARAVIND INTEGRATED EYE BANK SERVICES

Madurai  
Tirunelveli  
Coimbatore  
Pondicherry

## EDUCATION AND TRAINING

ARAVIND POSTGRADUATE INSTITUTE OF OPHTHALMOLOGY

LIONS ARAVIND INSTITUTE OF COMMUNITY OPHTHALMOLOGY (LAICO)

## RESEARCH

ARAVIND MEDICAL RESEARCH FOUNDATION

DR. G. VENKATASWAMY EYE RESEARCH INSTITUTE

Basic and translational research  
Clinical research  
Operations research  
Product development in eye care

## CONSULTANCY AND CAPACITY BUILDING

LIONS ARAVIND INSTITUTE OF COMMUNITY OPHTHALMOLOGY (LAICO)

Sharing best practices of Aravind  
Advocacy in eye care

## OPHTHALMIC SUPPLIES AND EQUIPMENT

### AUROLAB

Intraocular lens  
Pharmaceuticals  
Suture needles  
Equipment  
Surgical blades  
Special products

# Highlights

*As the reporting year came to an end on 31st March 2020, the multi-faceted and colossal activities of Aravind Eye Care System also slowly ground to a halt... almost. The national lockdown that was a lot more stringently enforced in Tamil Nadu reduced the patient care activities in the hospitals, just to emergencies. As did the production at Aurolab. As the scale of the pandemic unfolded, all workshops and training activities that were planned at LAICO were cancelled or deferred to a future date as were travels to attend or organise conferences elsewhere. This was a truly unprecedented situation that came on all too suddenly, catching everyone unprepared. What mattered was how quickly could an organisation pivot to do what was feasible and what was required. That is just what Aravind did and did it at remarkable speed.*

## An Unprecedented Challenge

The innovative spirit across the organisation was unleashed with literally an innovation a day: from sophisticated 3D printed personal protective gear to do-it-yourself face shields. Aurolab too switched gears from selling eye care products to ophthalmologists to equipping them with personal protective gear free of cost. As the Tamil Nadu state went into lockdown with most employees either unable to come to work or not required to work for want of patients and the revenues plummeting down to near zero, the question in everyone's mind was, will the staff be paid? The



*Illustration by Dr. D.Sathish, Consultant, Cornea Services, Aravind-Madurai*

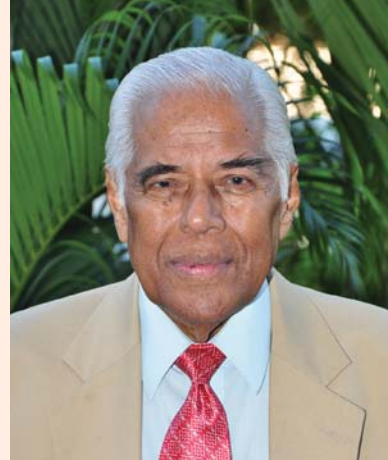


leadership without hesitation and almost as a reflex action decided that the staff will continue to be paid as long as their services are made available regardless of the hospital's capacity to utilise them under the current circumstances. Recognising that the patients won't be able to come to the hospital due to travel restrictions, a telemedicine portal was launched almost immediately to provide a first line of advice and to evaluate the level of urgency to intervene.

All protocols such as hand washing, temperature screening, physical distancing, eliciting travel history and so on were put in place almost immediately to make the hospital safe for both the staff and patients. It was recognised early on that these safety protocols will need to be practised long after the relaxation of the lockdown, when the patient demand will start rebounding to normal levels. This led to a lot of innovations and initiating changes in patient flow such as the introduction of scheduling system to spread out the patient intake, steps to reduce the time patients spend in the hospital and integrate telemedicine into regular patient care. All these changes are patient-centric and thus will continue to be relevant even when things return to normal. Aravind is following the adage that one should "never let a serious crisis go to waste".

### Steady Growth and Expansion

Though the year ended with a bang of unexpected sort, it was filled with activities, growth and development. A new Aravind Eye Hospital came up in Kovilpatti thanks to the generosity of Seethalakshmi-Tirupathi Naidu family of New Appaneri donating two acres of land. The hospital was inaugurated on Sunday, 29th September 2019 and got into regular functioning immediately. In less than six months, the hospital was seeing over 100 out-patients and performing 5 to 10 surgeries a day. This is a testimony, both to the need in the community and their trust on Aravind Eye Hospitals. During, the year four more vision centres were added in Vadalur; Ramakrishna Road-Salem; Omalur and Pallapati, taking the total of vision centres to 79. While the plans for the



*Dr. R. Pararajasegaram*  
*May 10, 1928 - May 5, 2020*

### Remembering Para...

*...as the role model and advocate for the spirit in which eye care should be delivered, 'healing the person and not just the eye.'*

*Dr. Para led a full life, touching the hearts and influencing the minds of countless eye care professionals across the globe. He played a pivotal role in bringing a public health perspective to eye care in developing countries.*

*Though his passing will leave a void, his life will be celebrated by perpetuating what he stood for.*

new hospital at Tanjore as well as the permanent hospital at Salem are getting ready, procedural delays are holding up the construction of the hospital at Dindigul and the significant expansions planned at Tirunelveli, Coimbatore and Aurolab.

On the patient care front, the growth has been nominal with 4.6 million outpatient visits and close to 520,000 surgeries clocking a 4.7% and 3.3% growth respectively over the previous year. This growth was spread across hospital walk-in patients, both paying and free as well as in Vision centres. On account of restrictions brought about by the COVID-19, an estimated 100,000 outpatient visits and 3,500 surgeries were lost.

On the overseas front, the Tulsi Chanrai Foundation Eye Hospital in Abuja, Nigeria

managed and run by Aravind Eye Hospital, was formally commissioned by H.E. Muhammadu Buhari, President of the Federal Republic of Nigeria on July 11, 2019. In addition to providing high quality eye care, the hospital will develop into a premier ophthalmic training institute for all cadres of eye care professionals, thus providing much-needed eye care and building the national capacity. The hospital within 8 months of formal opening was already handling over 3,000 outpatients and performing 400-500 surgeries a month. Close to 75% of these surgeries were on patients brought through eye camps and provided free of cost. This possibly places the hospital amongst the highest performing eye hospitals in Nigeria.

### Information Technology to Drive Patient Care

As elsewhere, Information Technology (IT) is getting more and more pervasive within Aravind. From being an enabler of support services like accounts, supplies, human resource management and such administrative tasks, IT has now moved into driving the core function. With the introduction of in-house developed electronic



*Inauguration of Aravind Eye Hospital at Kovilpatti*



medical records, information technology now drives the caregiving process and thus essentially the whole organisation. It has now become critical to have a very robust design and development process so that every deployment happens flawlessly. If in spite of this, something goes wrong, it is important to have in place a very responsive support team. In today's time of cyber-attacks and viruses continually infiltrating the IT systems, security aspects are becoming paramount. All of this required a significant overhaul of the IT services and this has been of major focus during the past year under the leadership of the newly appointed Chief Information Officer, Mr. Saravanan Sankaran. As these changes are falling in place and settling down, the users are able to feel the difference and appreciate the same.

### Synergy for Systematic Learning

One of the attributes that defines Aravind is its ethos of continuous learning and improvement. Though there are some systems and process, it is largely organic and driven by a few. Recognising that, this needs to be system-wide within Aravind and the necessity to build competency to drive this systematically in other hospitals that Aravind mentors, LAICO reached out to Institute for Healthcare Improvement (IHI) in Boston, USA. In response to this, Dr. Kedar Mate, who was then the Chief Innovation and Education Officer at IHI, came and spent a month coaching LAICO faculty and hospital teams. A thought that emerged during this period in Kedar's words was "*find a way for IHI and Aravind to get closer together. I believe both organisations have a lot to learn from each other and the relationship would be founded on that kind of mutual sharing of knowledge*". Quite recently, Kedar was elevated to become the President and CEO of IHI and it gives hope for the blossoming of a new synergistic relationship.



*Shri. Suresh Kumar Khanna, Hon'ble Cabinet Minister for Finance, Parliamentary Affairs and Medical Education, Govt. of UP visiting Aravind along with senior health officials*

### Formal Structure to Central Office Functions

Another major development was the formal structuring of several central functions. Aravind Eye Care System has been steadily growing in size, locations and activities. It is now in 100 locations, engaged in patient care, education, IT services, capacity building of other eye hospitals, research and manufacturing. While there was an ad hoc structure that was giving policy and co-ordination support as required, the need for a formal central structure was becoming abundantly clear. The launch of this was kick-started during a daylong workshop in November 2019 wherein the designated heads of the following central functions presented their vision and plans - Human Resources, New Projects, Finance, Information Technology, Quality, Operations and Research.

### Developments in Consultancy and Capacity Building

LAICO had a very productive year on all fronts. Two capacity building initiatives came to an end this year. One was supported by Lavelle fund to mentor 25 hospitals while the other was funded by Seeing is Believing initiative of Standard Chartered Bank to work with 13 hospitals. Together, these 38 hospitals did 73,000 additional cataract surgeries



during the last year of the project, registering an increase of 52% over the baseline year.

Shri. Rajeev Agarwal, an entrepreneur from Uttar Pradesh (UP), with operations both in India and USA was keen to enhance eye care in UP. It started with him wanting to improve the branch of Sitapur Eye Hospital in his hometown, Shahjahanpur in UP. After doing some research for technical support, he got in touch with Aravind and soon made a visit to get a deeper understanding of what LAICO and Aravind can offer. During the visit, he challenged LAICO to take on improving eye care in entire UP, covering both eye care delivery and developing the required ophthalmic human resources. For his part, he offered to facilitate and finance the initiative to the extent that he can. As an immediate step, in order to build the political will, he facilitated the visit of a team of high-powered senior health officials from UP headed by Shri. Suresh Kumar Khanna, Hon'ble Cabinet Minister for Finance, Parliamentary Affairs and Medical Education, Govt. of UP. Work is progressing on this front, as much as it can with all the challenges brought about by the COVID pandemic.

### Focus on Demand

Aurolab's e-see, the portable, affordable and accurate auto-refractor is receiving increasing market acceptance. With many such product developments in the pipeline, Aurolab has been equally focussing on the demand side as well. It became one of the few Indian companies to complete registration of a wide range of eye drops in Nepal. Likewise, it successfully completed the audit from Brazilian Health Regulatory Agency which regulates the use of medical products.

### Early Prediction of Eye Disorders through Research

Research efforts at AMRF have caught the attention of private organisations and some have come forward to fund projects of translational potential. One such project studies early onset of glaucoma in an extended family in a local village in Tamil Nadu. More than fifty members

of this family were screened for myocilin mutation, the results of which will pave the way for pre-symptomatic diagnosis of the disease. Another major project studying the role of ocular microbiome in the onset, progression, and outcome of fungal keratitis has been initiated. Genome-wide sequencing studies were utilised extensively for the identification of genomic variants, and these mutations can be used for early prediction of eye disorders. The role of micro RNAs in several ocular conditions studied from different angles has reached a stage to consolidate.

### Green Initiatives

For long Aravind has been environmentally conscious, largely driven by the “frugality” mindset of not wasting anything and constantly striving for more efficient ways or using less resources while doing any activity. As the environmental issues were coming to the forefront, Aravind too became more conscious and introduced many environment-friendly initiatives on several fronts - large scale use of green energy (solar and wind); recycling and reuse; innovatively “upcycling”; educating patients to appreciate and implement environment-friendly initiatives at their level and so on. Aravind-Pondicherry has taken a lead in this and has been actively championing this both within Aravind network and outside.

### A Unique Recognition

Aravind Eye Hospital as part of its academic outreach, in the recent years, has been involved in training doctors, nurses and staff from the Commonwealth as part of a five-year programme funded by the Queen Elizabeth Diamond Jubilee Trust (QEDJT). In appreciation for having taken up almost 40% of the training work, Dr. N. Venkatesh Prajna, Director-Academics was invited to a grand reception by Her Majesty Queen Elizabeth in the Buckingham Palace, London. He was amongst the select group of 40 people from 32 countries, associated with the QEDJT programmes including ophthalmologists, ambassadors and secretaries from the Commonwealth.



Dr. William B. Stewart with Dr. Usha Kim, Dr. R.D. Ravindran, Mr. G. Srinivasan and Dr. P. Namperumalsamy at the Dr. G. Venkataswamy Endowment Oration ceremony

## Platform to Share and Update

Of late, it has become common for Aravind to host annual conferences of various national and international societies in eye care. These are mostly done on request, and during the year, two annual conferences, of VISION 2020: The Right to Sight and Asia Pacific Teleophthalmology Society (APTOS) were organised. Even though the successful conduct of these events demands a lot of Aravind's resources and well co-ordinated efforts, it benefits the organisation in terms of collective learning and networking opportunities, apart from building team spirit and a new vigour amongst the staff.

## Beyond Eye Care

The spirit of service at Aravind continues to be fostered not only by the day-to-day work of serving all those in need of eye care but also reaching out to people elsewhere. Angaadi, the biennial charity fest for the staff to promote the spirit of giving was held at Aravind-Madurai on January 10-11 and at Aravind-Pondicherry on January 10. Articles, new and old ranging from utensils, paintings, artefacts, books, clothes to old electronic gadgets, bags and accessories were sold at the event at a nominal price and the proceeds were donated to charity. Mahatma Gandhi's teachings had a profound impact on Aravind's founder, Dr. V. Several

programmes were organised at Aravind on the occasion of Gandhiji's 150th birth anniversary to reinforce and appreciate the values which he stood for. Auroutsav, the biennial literary, sports and art competitions for employees across the centres was conducted in August 2019, on the theme, Tribes of South India. The event, in addition to promoting team spirit, paved the way to understand the diverse traditions and practices of each tribal community, and how they contribute to the rich culture and heritage of the nation as a whole.

## Dr. G. Venkataswamy Endowment Oration

Aravind was honoured when Dr. William B Stewart, a renowned Oculoplastic Surgeon and former Chair of the Department of Ophthalmology, California Pacific Medical Center, accepted the Dr. G. Venkataswamy Endowment Award 2019. Inspired by Aravind, at the peak of his career as an ophthalmologist, he decided to leave surgery and started exploring the establishment of an integrative medical programme. He ended up co-founding the Institute for Health and Healing (IHH) at California Pacific Medical Center, San Francisco which combined the benefits of modern medicine with an integrative approach. At the award ceremony held on October 1, Dr. Stewart delivered the oration titled, "More than meets the eye: The Legacy of Dr. V."

# Patient Care

*Aravind is seeing tremendous growth, especially on the infrastructure front to accommodate the increasing demand for its services. Several new centres are opened offering primary, secondary and tertiary eye care. In addition to routine eye care delivery, in the last year, proactive efforts were taken to address blindness due to eye conditions like Retinopathy of Prematurity (RoP) and promote family screening for glaucoma.*

*Owing to COVID-19 threat, Aravind Eye Hospitals, for the first time since inception remained closed, except for emergency cases. All elective procedures were suspended. The primary responsibility during those critical days was to ensure the safety of its facilities so that patients who visit for emergency eye care and the frontline staff including doctors, paramedics and support staff are adequately protected from the spread of Corona infections. To make sure that the patients continue to receive care, teleconsultation was started in all major centres of Aravind.*

## EYE HOSPITALS

### Steady Expansion

Aravind Eye Care System opened its 14th eye hospital at Kovilpatti on September 29, 2019. The organisation is grateful to Seethalakshmi Thirupathi Naidu family - Dr. T. Srinivasan, Thiru.T.Lakshmi Narayanan and Dr. T. Jaganathan-for their generous donation of land to make this facility a reality. With a built up area of 17,300 sq.ft, the hospital is Aravind's 7th secondary care centre and has the capacity to handle nearly 60,000 outpatient visits and 6,000 eye surgeries a year. Like other Aravind centres, the hospital offers 50% of its services either free or at deeply subsidised rate.

*Dr. M. Sivadarshan examining a patient at Aravind-Kovilpatti*



Aravind's first overseas venture, the Tulsi Chanrai Foundation Eye Hospital in Abuja, Nigeria is completing its first year of service. In the year ending March 2020, the hospital has catered to over 24,000 patient visits and 4,000 surgeries. Over 100 outreach camps were conducted. In addition, the hospital regularly organises eye care awareness programmes. To better cater to increasing patient volumes, infrastructure expansion is currently underway at Aravind-Coimbatore and Tirunelveli. An exclusive Glaucoma clinic was opened in Aravind-Chennai on April 24, 2019.

### NABH Accreditation

Complying with NABH standards enables an organisation in demonstrating high quality care with best clinical outcomes and ensuring patient safety. Aravind Eye Hospitals at Madurai, Coimbatore, Tirunelveli, Pondicherry, Salem, Udumalpet and Tirupur have received NABH pre-accreditation certification, which is audited and renewed every two years. Aravind Eye Hospitals in Tuticorin, Dindigul, Coimbatore City Centre and Theni have documented and submitted for pre-accreditation certification. Aravind-Chennai is awaiting assessment for the full accreditation.

Aravind-Tirunelveli, Coimbatore and Pondicherry successfully complied with the NABH Quality Council of India Kayakalp standards, each scoring above 90%.



## Projects to enhance eye care service delivery

In order to constantly work towards improving eye care delivery systems, several projects are underway across all Aravind Eye Hospitals, funded by NGOs and corporates.

### Tele-screening to Fight Blindness due to Retinopathy of Prematurity (RoP)

With the newborn babies who need to be tested for RoP in neonatal centres, government hospitals etc., telecreening seemed to be the best option to reach out to all those who needed this investigation.

Aravind Eye Hospitals at Tirunelveli, Madurai and Theni with support from Global Business Services Standard Chartered Bank (GBS-SCB) are implementing tele-screening for identifying RoP. With the help of a retinal camera, trained technicians screen babies in the neonatal intensive care units and the images are transmitted real-time to a retina specialist at the base hospital. The specialist grades the images and sends back a report, based on which appropriate referral and treatment are provided.

The project at Aravind-Tirunelveli was completed in 2019 having screened over 5,000 infants. Following the success of this project, an order has been issued by the Director of Medical Education, Govt. of Tamil Nadu,

to facilitate RoP screening in government facilities in collaboration with private hospitals.

Aravind-Madurai performed telecreening of over 2,000 infants in the districts of Madurai, Sivagangai and Virudhunagar. Over 1,500 infants benefitted through the telecreening organised by Aravind-Theni in Idukki and Kottayam districts of the state of Kerala.

Dr. Prerana Shah won the Bayer Global Ophthalmology Award for the year 2019 which facilitated telecreening of about 1,500 babies in Madurai, Sivagangai, Ramanathapuram and Virudhunagar districts.

HCL Foundation supports telecreening for RoP projects at Aravind-Coimbatore and Aravind-Salem. Aravind-Salem covers the neonatal intensive care units of government hospitals at Salem, Dharmapuri and Namakkal, while Aravind-Coimbatore covers Hosur, Krishnagiri and Tiruchengode districts. Over 2,300 preterm babies were screened in the year-ending March 2020. With support from Cognizant Foundation, Aravind-Chennai started telecreening for RoP in October 2019. A total of 488 babies were screened.

### Free Care for Economically Disadvantaged Patients with Corneal Diseases

In collaboration with GBS-SCB, Aravind-Madurai is supporting patients with corneal ulcers or ocular trauma, belonging to low socioeconomic status. During





*We shall overcome ..*



*Retinoblastoma (RB) is the most common eye cancer in children and usually occurs before five years of age. Like any other cancer, retinoblastoma can spread to other parts of the body, and even risk lives. The disease is completely curable if diagnosed early. But the sad part is that, often times, the delay in seeking treatment costs the eye and sometimes even life.*

*About half of the RB cases are inherited. Aravind's cost-effective genetic testing methodology, the first-of-its-kind in India helps predict the disease in siblings, offspring and secondary tumours in the same patient. Since cancer treatment is well beyond the means of most Indian families, the Ring of Hope fund supports the economically disadvantaged sections of the society by providing full course of treatment-diagnosis, genetic testing, surgery, chemotherapy, radiation and prosthesis-all free of cost.*

*Every year, Retinoblastoma Awareness Week is observed in May to raise awareness about the disease. At Aravind, the week is celebrated with many programmes and the highlight is the "Survivors' Meet". Children who have undergone treatment for RB and got cured are invited along with their families to spend a day at Aravind, filled with fun and entertainment.*





*At the valedictory function of the corneal ulcer project supported by GBS-SCB - Mr. S. Vengadesan, Member of Parliament; Mr. Shivraj V Patil, Former Justice of the Supreme Court of India and Dr. N. Venkatesh Prajna along with a few beneficiaries*

2017-2019, over 3,400 patients with corneal ulcers benefitted from the project which covered the cost of medication, travel and surgery. In the year ending March 2020, close to 550 patients benefitted from the ocular trauma project.

### **Early Detection of Glaucoma and Improving Adherence to Follow up**

Since genetic factors play a key role in all major forms of glaucoma, a project to screen the first degree relatives of patients with glaucoma was launched to enhance early detection. Supported by GBS-SCB, the project is

implemented in Aravind Eye Hospitals at Pondicherry, Madurai, Tirunelveli, Coimbatore and Chennai.

When a patient is diagnosed with POAG, PACG or pseudoexfoliation glaucoma, a detailed report consisting of patient demographics, ocular examination history, diagnosis, treatment advised and severity of glaucoma is drawn. The number of first degree relatives, their relationship to the patient and their phone numbers are entered into the software developed exclusively for the project. The software generates and sends automated short messages or voice messages motivating the relatives to come for screening. Reminders are sent if they do not turn up within a

*Mr. Namdeo Kadam, Assistant General Manager, GIC., Dr. P. Namperumalsamy, Dr. R.D. Ravindran, Dr. S.R. Krishnadas and the project team at the inauguration of the GIC - funded glaucoma project in Madurai*







*Screening of school children to detect refractive errors*

certain period. Until March 2020, messages were sent to 3492 relatives of 1449 glaucoma patients. 500 relatives came for screening, among which 23 were identified as having glaucoma and another 84 were identified as glaucoma suspects and are under observation or advised further evaluation. Aravind-Madurai and Aravind-Theni aim to reduce vision impairment due to glaucoma by awareness creation, early detection through screening camps and supporting cost of surgery for those who cannot afford it. The project is funded by General Insurance Corporation (GIC), Mumbai. The project was inaugurated by Mr. Namdeo Kadam, Assistant General Manager, GIC on October 6 at Madurai. Aravind-Madurai conducted 12 camps through which 1,300 patients were screened and in the 16 camps organised by Aravind-Theni 1,100 patients were screened. A total of 99 patients underwent glaucoma surgeries free of cost.

Aravind-Madurai took measures to improve management of childhood glaucoma by better understanding the context of the caregivers of children with the disease. Implemented in collaboration with

*At the presbyopia screening camp for women*



*Dispensing spectacles*

United States Agency for International Development (USAID), USA, the project aims to understand the predictors and barriers of adherence to long term follow-up of childhood glaucoma and identify the key factors that contribute to poor adherence. The team has selected a sample of 140 children for the study.

### **Addressing Blindness due to Refractive Errors in Children**

Aravind-Madurai and ORBIS, an international not-for-profit organisation is implementing the project to screen 400,000 school going children for visual problems to address the problem of uncorrected refractive errors. The project also aims to create awareness towards increasing spectacle compliance amongst the target population, consisting of parents, teachers and children. In the year ending March 2020, trained vision screeners screened 89,114 students from 191 schools. 9,584 students were referred for secondary evaluation. Among the referred, 6,776 (70%) children were examined by optometrists. A total of 2,302 children received spectacles, while 1,950 children already wearing spectacles were advised to continue the same. 676 children were referred to base hospital and vision centres for further evaluation. Among those, 263 students turned up for treatment at the base hospital.

### **Impacting Quality of Life in Women through Presbyopia Correction**

Research shows that women have a higher prevalence of and more severe, presbyopia. However, women are less likely to come forward for eye examination even less likely for spectacle correction. Through the project funded by GBS-SCB, Aravind-Coimbatore conducts camps to screen women for presbyopia correction. A total of 52 camps were conducted in the year ending

March 2020. Over 10,800 women were examined and 2,888 received spectacles free of cost. Over 30 follow up camps were conducted to assess the quality of life of these women following spectacle usage.

### Equipping Government Health System to Effectively Manage Diabetic Retinopathy

The project implemented by Aravind-Tirunelveli aimed to develop a district-level model to build the capacity of the government health system in the management of diabetic retinopathy (DR). The project was executed in five community health centres and 13 primary health centres in Tirunelveli district. A total of 198 health professionals were trained in screening, diagnosis and management of DR. Over 8,500 people with diabetes registered at the 18 CHCs/PHCs, 6,460 (75.4% of those registered) were screened. Queen Elizabeth Diamond Jubilee Trust (QEDJT) in association with Public Health Foundation of India (PHFI) supports the project.

### Comprehensive Centre for Correcting Facial Deformities

Aravind-Chennai has joined hands with Saveetha Medical College and Dr. P. Anantha Narayanan, an Oculofacial surgeon to establish a centre of excellence in the treatment of Oculofacial and orbito-cranial deformities. Suitable cases identified and screened by the Aravind team are chosen for facial reconfiguration



*Dr. S. Aravind signing the MoU with Mr. Arno Tellman, Head-Novartis India Global Drug Development Centre in the presence of Dr. Vasant Narsimhan, CEO, Novartis*

using the latest three-dimensional imaging. Appropriate surgical modalities will be advised in multiple sittings. On the infrastructure front, Aravind-Chennai has installed 3D Navigational platform, Sonopet and Special OT lights. The first case was done in August 2019 and so far 14 cases have been completed with excellent outcome. Partial funding for the project is provided by TATA Lockheed Martin Aero Structures Ltd (TLMAL).

### Collaboration for Development

Aravind Eye Hospitals entered into a Memorandum of Understanding (MoU) with Novartis to collaborate for mutual development in the areas of early diagnosis of eye diseases and intervention, drug discovery and development, leadership development, research capability and use of big data.

*Dr. Syed Mohideen Abdul Khadar handling an awareness session as part of QEDJT-PHFI DR project*





## Seeing is Believing ...



Exhibit at Aravind-Pondicherry



World Sight Day at Aravind managed Tulsi Chanrai Foundation Eye Hospital at Abuja, Nigeria

Aravind Eye Hospitals actively invest time and effort in creating awareness on various eye diseases, through exhibits, rallies, street plays and lectures while observing special days and weeks such as World Sight Day, World Diabetes Day etc.

Focus is on eye diseases that lead to irreversible vision loss. [Awareness videos](#) on eye diseases were developed to screen in waiting areas across the hospitals and also to share via social media platforms. Creating awareness improves the eye health seeking behaviour of the community, which in turn will significantly contribute to Aravind's mission of eliminating needless blindness.



## Awareness Creation Programmes



Rally to create awareness on diabetic retinopathy, Aravind-Tirunelveli

World Prematurity Day exhibit at Aravind-Coimbatore



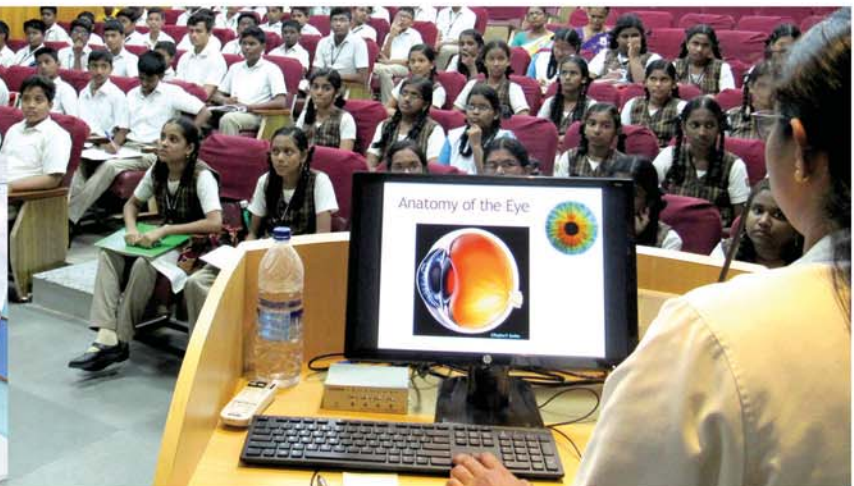
Retinoblastoma Awareness Week at Aravind-Madurai



Awareness creation on RoP

Eye care awareness talk to school children

World Pathology Day exhibit at Aravind-Madurai





*It is ourselves,  
we are helping ...  
It is ourselves,  
we are healing ...  
- Dr. V.*

### Out-patient Visits

#### HOSPITALS

Paying Sections	2,496,547
Free Sections	707,299

#### OUTREACH

Screening camps	531,896
Vision Centres	688,566
Community Eye Clinics & City Centres	192,073
<u>Total out-patient visits</u>	<u>4,616,381</u>

### PERFORMANCE APRIL 2019 - MARCH 2020

	Total	Madurai
<b>OUT-PATIENT VISITS</b>		
<b>HOSPITALS</b>		
Paying Sections	<b>2,496,547</b>	670,073
Free Sections	<b>707,299</b>	194,583
<b>OUTREACH</b>		
<b>SCREENING CAMPS*</b>		
Comprehensive camps	<b>354,183</b>	94,889
Diabetic Retinopathy screening camps	<b>38,426</b>	11,817
Workplace refraction camps	<b>54,944</b>	13,848
School children examined by Aravind staff*	<b>52,799</b>	8,849
Paediatric eye screening	<b>9,965</b>	-
Mobile van refraction camps	<b>9,284</b>	-
RoP - No. of babies screened in NICUs	<b>12,295</b>	2,256
<b>TOTAL FROM SCREENING CAMPS*</b>	<b>531,896</b>	131,659
<b>VISION CENTRES</b>	<b>688,566</b>	285,132
<b>COMMUNITY EYE CLINICS &amp; CITY CENTRES</b>	<b>192,073</b>	105,629
<b>TOTAL OUT-PATIENT VISITS</b>	<b>4,616,381</b>	1,387,076
<b>SURGERIES, LASER PROCEDURES &amp; INJECTIONS</b>		
Paying Sections	<b>276,178</b>	85,833
Subsidised (walk-ins to the free hospital)	<b>150,189</b>	48,302
Free (through screening camps)	<b>92,771</b>	28,767
<b>TOTAL SURGERIES</b>	<b>519,138</b>	162,902

\*While Aravind team screened 52,799 children, an additional 421,560 children

### SURGERIES

	Total	Madurai
Cataract surgeries	<b>317,503</b>	99,518
Trab and combined procedures	<b>6,256</b>	1,446
Retina and Vitreous surgeries	<b>17,819</b>	6,556
Squint correction	<b>2,374</b>	1,057
Keratoplasty (Incl. Graft procedures, Keratotomies, DSAEK)	<b>2,780</b>	780
Pterygium surgeries	<b>7,085</b>	2,478
Ocular injuries	<b>528</b>	172
Lacrimal surgeries	<b>6,268</b>	2,581
Orbit and Oculoplasty surgeries	<b>9,826</b>	2,976
Refractive laser procedures	<b>6,383</b>	2,229
Retinal laser procedures	<b>45,102</b>	12,678
YAG laser procedures	<b>45,113</b>	14,047
Intravitreal injections (Anti VEGF & Steroids)	<b>33,500</b>	10,605
Other surgeries, Laser procedures & Injections	<b>18,601</b>	5,779
<b>TOTAL SURGERIES</b>	<b>519,138</b>	162,902



Theni	Tirunelveli	Coimbatore	Pondicherry	Tirupur	Dindigul	Salem	Tuticorin	Udumalpet	CBE CC	Chennai	Tirupati	Kovilpatti
99,470	333,044	378,015	304,174	52,511	77,861	137,555	60,360	43,415	40,679	203,693	86,195	9,502
25,945	82,596	132,165	111,814	16,224	-	22,940	11,839	23,542	-	51,614	32,225	1,812
17,106	42,555	74,840	62,416	3,526	-	14,650	3,827	3,321	-	27,985	9,068	-
3,301	3,225	12,491	7,387	-	-	-	-	-	-	205	-	-
2,514	12,747	8,994	6,616	955	-	3,064	1,285	1,672	-	2,791	458	-
1,035	6,171	5,668	19,690	1,623	-	1,119	-	-	-	2,517	6,127	-
1,252	1,411	979	5,873	-	-	-	-	-	-	450	-	-
609	-	8,675	-	-	-	-	-	-	-	-	-	-
1,573	2,068	5,555	430	-	-	-	-	-	-	413	-	-
27,390	68,177	117,202	102,412	6,104	-	18,833	5,112	4,993	-	34,361	15,653	-
68,482	147,737	53,949	101,096	13,980	-	2,395	-	15,795	-	-	-	-
22,171	30,567	-	33,706	-	-	-	-	-	-	-	-	-
243,458	662,121	681,331	653,202	88,819	77,861	181,723	77,311	87,745	40,679	289,668	134,073	11,314
9,498	37,238	49,643	34,773	3,531	5,294	12,758	3,248	3,590	2,770	21,018	6,727	257
4,602	15,243	30,785	21,915	1,993	1,987	4,481	2,057	5,084	-	8,692	4,880	168
2,451	10,158	22,954	17,832	533	-	3,520	387	525	-	3,935	1,709	-
16,551	62,639	103,382	74,520	6,057	7,281	20,759	5,692	9,199	2,770	33,645	13,316	425

were screened by teachers/vision screeners and found to be normal. This takes the total outreach screening to 953,456.

Theni	Tirunelveli	Coimbatore	Pondicherry	Tirupur	Dindigul	Salem	Tuticorin	Udumalpet	CBE CC	Chennai	Tirupati	Kovilpatti
10,974	34,367	59,216	45,856	4,996	5,680	14,133	4,604	7,775	1,681	19,366	9,059	278
85	1,384	1,570	1,032	33	22	94	95	72	32	322	69	-
54	1,681	5102	2,576	-	-	375	-	1	-	1,187	287	-
-	353	661	205	-	-	-	-	-	-	80	18	-
6	398	751	580	-	-	36	-	-	-	224	5	-
276	464	1269	1,163	92	144	392	32	109	44	527	95	-
1	63	151	82	2	1	23	-	-	-	17	16	-
42	604	1813	827	-	47	23	1	-	-	281	49	-
164	1,178	3000	1,531	87	127	109	2	16	2	529	100	5
-	930	902	1,025	-	-	177	-	-	-	1,004	116	-
1,481	7,517	9,399	7,540	-	-	1,380	-	-	396	3,439	1,272	-
2,306	6,969	8,821	2,788	688	1,160	2,418	833	1,083	311	2,416	1,131	142
781	4,459	7,363	5,023	-	-	1,065	-	-	203	3,377	624	-
381	2,272	3,364	4,292	159	100	534	125	143	101	876	475	-
16,551	62,639	103,382	74,520	6,057	7,281	20,759	5,692	9,199	2,770	33,645	13,316	425

## COMMUNITY OUTREACH

- I. Free Eye Camps
- II. Community Eye Clinics and City Centres
- III. Vision Centres

### I. Free Eye Camps

Aravind Eye Hospitals undertook several new initiatives to enhance the quality and productivity of outreach camps. In the year ending March 2020, a total of 2,739 camps were conducted through which 531,896 patients (including babies examined for RoP) were screened. A total of 92,771 patients underwent surgery at the base hospitals.

#### New Initiatives

Since the number of patients who could not undergo the advised eye surgeries due to systemic diseases was found to be high, a system was put in place at Aravind-Madurai to address it. The patient counsellors call these patients, remind and motivate them to come for surgery after their vital parameters are brought within normal limits. As part of enhancing the quality of outreach, electronic medical record has been implemented in most of the camps conducted by Aravind-Pondicherry. This initiative is supported by GBS-SCB. Images of clinical findings are shown to help patients understand their disease in a much better way, thus improving awareness and compliance. Patient education is made easier and effective with this approach.

As a pilot, workplace screening camps of Aravind-Madurai employs e-see, a durable, handheld device developed by Aurolab to produce clinically accurate autorefractometer measurements. Aravind-Madurai has entered into a partnership with Bharat Heavy Electricals

Ltd; (BHEL) to conduct camps in Uppur, RS Mangalam and Thirupalaikudi of Ramnad district. The first camp was held on March 8 screening over 250 patients. About 50 underwent surgery.

#### Annual Planning Meeting

The annual planning meeting of outreach departments across the Aravind centres conducted in January discussed ways to intensify the reach of camps, mainly by identifying untapped areas. As a pilot programme, special software is being used to aid in effective location selection and camps are being organised accordingly.

#### Community Sponsors and their Continuing Support

Sponsors play a huge role in ensuring the success of Aravind's camps. Aravind-Madurai honoured Nagar Nala Committee, T.Kallupatti for having sponsored 250 camps at T.Kallupatti. Mata Amritanandamayi Math at Tirupparankundram was felicitated on the occasion of it sponsoring the 150th camp.

#### Recognitions

Mr. Jeyaraj, Camp Manager, Aravind-Theni was awarded an appreciation certificate by Lions Club of Cumbum on October 12. Lions Club of Ponnamaravathy Royal honoured Mr. P. Vivekanandan, Camp Organiser, Aravind-Madurai with the Best Camp Organiser Award on January 5.

### II. Community Eye Clinics and City Centres

In the year ending March 2020, four community eye clinics and two city centres together handled 192,073 patient visits.

*Mr. P. Vivekanandan being honoured by the Lions Club*



*Annual camp meeting at Aravind-Pondicherry*





## Outreach Performance

	Total	Madurai	Theni	Tirunelveli	Coimbatore	Pondicherry	Tirupur	Salem	Tuticorin	Udumalpet	Chennai	Tirupati
<b>SCREENING CAMPS</b>												
<b>Comprehensive Eye Camps</b>												
Camps	1,704	419	110	274	336	274	18	74	29	14	107	49
Patients examined	354,183	94,889	17,106	42,555	74,840	62,416	3,526	14,650	3,827	3,321	27,985	9,068
Glasses prescribed	83,392	18,343	4,891	11,043	15,240	14,655	1,167	3,603	832	658	10,926	2,034
Glasses delivered	74,018	16,829	4,631	9,363	12,835	12,874	975	3,304	710	510	10,216	1,771
Glasses dispensed on the spot	64,106	14,942	3,579	7,907	11,980	10,886	892	2,095	566	419	9,378	1,462
<b>Diabetic Retinopathy Screening Camps</b>												
Camps	302	60	72	31	68	70	-	-	-	-	1	-
Patients examined	38,426	11,817	3,301	3,225	12,491	7,387	-	-	-	-	205	-
Diabetics screened	19,335	5,667	3,156	1,302	5,063	3,947	-	-	-	-	200	-
DR Patients screened	2,407	766	327	248	513	479	-	-	-	-	74	-
<b>Refraction Camps</b>												
Camps	240	53	10	65	31	37	8	9	9	3	12	3
Patients examined	54,944	13,848	2,514	12,747	8,994	6,616	955	3,064	1,285	1,672	2791	458
Glasses prescribed	20,183	4,940	1,001	4,949	3,854	2,359	288	938	422	149	1093	190
Glasses delivered	17,397	4,793	894	4,452	3,084	1,830	220	803	382	88	694	157
On the spot deliveries	13,335	3,646	749	3,624	2,206	1,643	172	444	245	15	463	128
<b>Refraction Camps by Mobile Unit</b>												
Camps	59	-	8	-	51	-	-	-	-	-	-	-
Patients examined	9,284	-	609	-	8,675	-	-	-	-	-	-	-
Glasses prescribed	3,423	-	165	-	3,258	-	-	-	-	-	-	-
Glasses delivered	2,873	-	127	-	2,746	-	-	-	-	-	-	-
<b>Eye Screening of School Children-Base Hospital</b>												
Schools served	756	248	9	54	79	82	10	34	-	-	6	234
Camps	393	86	9	54	74	84	9	17	-	-	11	49
Teachers trained	3,083	74	49	1,439	293	1,228	-	-	-	-	-	-
Total children in school	473,803	121,446	9,690	80,951	62,197	97,342	8,479	18,544	-	-	13,850	61,304
Children screened by oph.	52,286	8,849	1,035	6,171	5,155	19,690	1,623	1,119	-	-	2,517	6,127
Children received glasses	18,403	3,195	375	3,256	2,792	5,677	291	627	-	-	948	1,242
Children identified with eye defects other than Refractive Error	4,641	1,415	50	603	554	1,084	105	118	-	-	197	515
<b>Eye Screening of School Children-Vision Centres</b>												
Schools served	5	-	-	-	5	-	-	-	-	-	-	-
Camps	5	-	-	-	5	-	-	-	-	-	-	-
Teachers trained	0	-	-	-	-	-	-	-	-	-	-	-
Total children in school	556	-	-	-	556	-	-	-	-	-	-	-
Children screened by oph.	513	-	-	-	513	-	-	-	-	-	-	-
Children received glasses	6	-	-	-	6	-	-	-	-	-	-	-
Children identified with eye defects other than Refractive Error	34	-	-	-	34	-	-	-	-	-	-	-
<b>Paediatric Eye Screening Camps</b>												
Camps	36	-	6	5	4	20	-	-	-	-	1	-
Children examined	9,965	-	1,252	1,411	979	5,873	-	-	-	-	450	-
Refractive errors	216	-	84	132	-	-	-	-	-	-	-	-
Glasses prescribed	2	-	2	-	-	-	-	-	-	-	-	-
Glasses delivered	2	-	2	-	-	-	-	-	-	-	-	-
Other defects identified	788	-	26	13	45	619	-	-	-	-	85	-
<b>RoP Screening</b>												
Screening visits	1,812	343	124	198	919	145	-	-	-	-	83	-
Babies screened	12,295	2,256	1,573	2,068	5,555	430	-	-	-	-	413	-
Babies with RoP	1,775	89	32	147	1,337	108	-	-	-	-	62	-
RoP Babies treated	349	37	27	125	131	18	-	-	-	-	11	-
<b>VISION CENTRES</b>												
Centres	79	32	7	15	6	12	2	2	-	3	-	-
New + Review	688,566	285,132	68,482	147,737	53,949	101,096	13,980	2,395	-	15,795	-	-
Out-patients / day	29	29	32	32	29	28	23	16	-	17	-	-
<b>COMMUNITY EYE CLINICS AND CITY CENTRES</b>												
Centres	6	3	1	1	-	1	-	-	-	-	-	-
New + Review	192,073	105,629	22,171	30,567	-	33,706	-	-	-	-	-	-
Outpatients / day	103	114	72	99	-	109	-	-	-	-	-	-

### III. Vision Centres

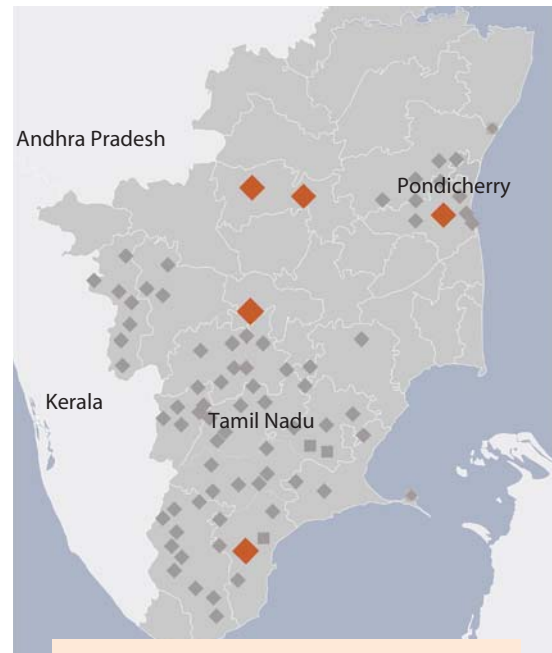
Aravind model of primary eye care delivery through vision centres has been widely acclaimed for its high penetration effect in rural and suburban areas. These centres motivate people to seek earlier treatment for vision problems. Of the patients who seek care at these centres, over 90% are fully treated on-site; less than 10% are referred to the base hospital for further treatment, either surgery or advanced investigations. Vision centres continue to receive a steady stream of visitors who want to get exposed to the model and replicate the same in their settings.

#### Skill Certification of Vision Centre Technicians

Competent and well-trained ophthalmic technicians contribute to the high efficiency and productivity of vision centres. Continuing medical education programmes were regularly organised to update their knowledge and to ensure they deliver the best care. A skill certification programme was organised during April 5-7 for the technicians of all the vision centres, the first of its kind at Aravind. About 150 technicians from across the centres attended. Assessment of skills and content knowledge was performed and certificates were given.

#### Awareness Creation in Community

To improve the health-seeking behaviour of the community, vision centres organised eye care awareness exhibitions and camps on various occasions.



- ◆ Existing Vision Centres
- ◆ Vision Centres inaugurated in the last year
  - Sathankulam, July 15, 2019 (shifted from Pudhiyamputhur)
  - Vadalur, October 2, 2019
  - Ramakrishna Mission Charitable Dispensary, October 4, 2019
  - Omalur, January 13, 2020
  - Pallapatti, February 12, 2020

#### Vision Centre Day

Vision centres across the Aravind Eye Hospitals observed the day on April 14 with a variety of programmes intended to create eye care awareness amongst the public.

*Skill certification programme for vision centre technicians*





## ARAVIND INTEGRATED EYE BANK SERVICES (AIEBS)

Aravind eye banks leveraged support from the community in promoting eye donation amongst the general public. Volunteers were identified to notify deaths in the community and motivate the family to donate eyes of the deceased. Rotary Aravind International Eye Bank (RAIEB), Madurai started a new initiative to tap death notification and promote eye donation by involving churches in the community. About 73% of the tissues collected last year were through community cornea retrieval programme. In addition to individuals, voluntary organisations like Lions Clubs, Rotary Clubs and a few NGOs acted as a bridge between the eye banks and public in facilitating eye donation.

Hospital cornea retrieval programme was strengthened with the addition of two more hospitals in the network. Trained counsellors were posted in several hospitals to motivate families to donate eyes. Technicians were appointed to procure tissues from these hospitals. 27% of the tissues collected were through hospital cornea retrieval programme.

Apart from tissue collection, AIEBS distributed cornea, sclera and amniotic membrane to 41 institutions in India, upon request. RAIEB, Madurai and IOB-Aravind Eye Bank, Coimbatore received quality certificate from SightLife, USA for meeting all the quality standards in eye banking.

### DSAEK Pre Cut Training Course

Four eye bank technicians, two each from Aravind-Madurai and Lions Eye Bank, Bangalore participated in the course, jointly organised by SightLife, USA and RAIEB at Aravind-Madurai from November 21 to 23, 2019.

### EBAI Award for the Best Eye Bank in South Zone



*Dr. N. Venkatesh Prajna addressing the audience at an eye donation awareness programme in Sivagangai Medical college*

### Training

RAIEB offered training in areas such as eye bank techniques, eye donation counselling and eye bank co-ordination. A total of eight trainees participated.

### Recognitions

RAIEB, Madurai shared the award for the Best Eye Bank in South Zone with Ramayamma International Eye Bank, L V Prasad Eye Institute, Hyderabad at the 11th National Conference of Eye Bank Association of India held at Bangalore on September 28. At the Eye bank Premiere League organised as part of the conference, the South Zone team consisting of Mr. D. Saravanan, Manager, RAIEB, Madurai won award for the best innovative concept.

### Awareness Creation

Aravind eye banks regularly organise sessions in educational institutions, hospitals and various offices to create awareness on eye donation and eye banking activities.

### Statistics 2019-2020

Centre	Eyes collected	Eyes utilised in Aravind	Sent to other institutions
Madurai	2608	1040	43
Coimbatore	1419	729	41
Tirunelveli	713	161	17
Pondicherry	1012	435	9
Total	5752	2365	110



## National Eye Donation Fortnight

Aravind Eye Hospitals organised programmes to create awareness and sensitise public on eye donation.

Role play



Experiencing blindness



Rally



Exhibits

Competitions for children





# Education and Training

*Aravind's education programmes are much sought-after by the ophthalmic community. Every year, Aravind receives trainees from across the world for its clinical, management and paramedical courses. In the year ending March 2020, a total of 545 candidates underwent structured training programmes.*

*Aravind regularly offers continuing medical education programmes focusing on varied topics - eye diseases, their management, diagnostic technique and treatment. Around 22 CMEs were conducted in the year ending March 2020.*

*In addition to these, Aravind, upon request from organisations organises several custom-designed courses in different aspects of eye care delivery. About 230 candidates attended such programmes in the year ending March 2020.*

## CONTINUING MEDICAL EDUCATION PROGRAMMES ORGANISED AT ARAVIND

### Advanced ReLOAD and Anterior Vitrectomy Workshop

Aravind-Chennai, April 26-27

The workshop covered advancements in phacoemulsification including complication management. Apart from lectures and interactive sessions, the workshop included live surgery and hands-on wetlab session.



### 15th Annual Conference of VISION 2020: The Right to Sight – India

Aravind-Chennai, June 8-9

Aravind Eye Hospital, Chennai hosted the conference which turned out to be an excellent platform to discuss, deliberate strategies for future especially in the context of integrating eye health into universal health. The two-day conference saw an overwhelming participation of around 700 delegates including registrants from over 150 hospitals and institutes, eminent faculty and more than 100 students.

### Diagnostics Skill Transfer Course

Aravind-Pondicherry, June 9

The course had sessions on investigations covering all sub-specialities in ophthalmology- the principles,

*Shri. Banwarilal Purohit, Hon'ble Governor of Tamil Nadu inaugurating the annual conference of VISION 2020*







*Advanced ReLOAD workshop*

mechanisms, indications, interpretations, case-based discussions and machine-based hands-on demonstrations. More than 50 participants consisting of ophthalmologists, postgraduates and fellows in and around Pondicherry participated.

### **CME on Hospital Infection Control and Operation Theatre Sterilisation Techniques**

Aravind – Coimbatore, June 30

The CME was organised for healthcare professionals in eye hospitals. Over 220 delegates from 50 hospitals across six states participated in this comprehensive CME.

### **Workshop on Descemet's Membrane Endothelial Keratoplasty (DMEK)**

Aravind – Madurai, July 4-5

Cornea Services at Aravind-Madurai organised the workshop in partnership with SightLife. Cornea consultants from Aravind-Chennai, Coimbatore, Tirunelveli, Pondicherry and Madurai participated.

*Participants of the workshop on DMEK*



*Diagnostics skill transfer course*

### **Cutting Edge-19**

#### **A Symposium beyond Trabeculectomy**

Aravind – Pondicherry, July 13-14

The symposium focused on various Minimally Invasive Glaucoma Surgeries (MIGS) and Aurolab Aqueous Drainage Implant (AADI). The highlight was the green protocol measures that were strictly followed in all the arrangements.

#### **Workshop on Research Methodology**

Two workshops on research methodology were organised for DNB residents, following the guidelines of the National Board of Examinations. Aravind-Madurai organised the workshop at Preethi Institute of Medical Sciences on July 27 and postgraduates from various disciplines in and around Madurai participated.

Aravind-Pondicherry conducted the workshop for Aravind's DNB residents on August 2.



*Dr. N. Venkatesh Prajna inaugurating the research methodology workshop at Preethi Institute of Medical Sciences*



*During the wetlab training session at Retina4U*

### Retina4U

Aravind – Pondicherry, August 25

The CME dealt with posterior segment complications related to cataract surgery. About 110 ophthalmologists participated.

### Cornea Connect 2019

Aravind – Chennai, September 7-8

Cornea Connect is a series of CMEs conducted biennially at Aravind and discusses interesting and recent advancements in the field of cornea. The fourth in the series was organised by Aravind-Chennai and had around 200 delegates as participants.

### 4th Annual Symposium of Asia Pacific Teleophthalmology Society (APTOS) 2019

Chennai, September 21-22

Aravind Eye Care System organised the symposium at ITC Grand Chola, Chennai. The theme was, *Evolution of Artificial Intelligence (AI) in ophthalmology and*

*its impact in teleophthalmology and innovative service delivery.*

About 320 delegates comprising medical specialists, ophthalmologists, engineers, students of medicine and engineering from colleges all around the world participated.

### AIOC-ARC Postgraduate Refresher Course

Aravind – Coimbatore, September 27-29

Aravind Eye Hospital, Coimbatore organised the course with support from Sun Pharma. About 220 postgraduates from 48 institutions across Tamil Nadu, Kerala and Pondicherry participated.

### Enhancing Low Vision 2019

Aravind-Chennai; October 20

The CME gave an overview of the magnitude, causes and assessment of low vision and highlighted low vision aids and the importance of early intervention and rehabilitation. Hands-on sessions with a display of all the latest low vision aids, mobility devices and assistive

*Participants at the annual conference of APTOS*



*Dr. R. Kim addressing the audience*







*Dr. M. Srinivasan interacting with the audience during Cornea Connect*

technology were organised. A total of 235 participants including optometrists, vision rehabilitationists, special educators and doctors attended.

### **CME on Infectious Keratitis**

Aravind-Tirunelveli, November 3

Managing infectious keratitis is a challenge even for eminent ophthalmologists. The CME aimed to throw light on the latest advances in the diagnosis and management of the disease. Over 100 delegates consisting of ophthalmologists and postgraduates participated.

### **Review Learning on Advancement and Development (ReLOAD) workshop**

Aravind-Chennai, November 4-5

Organised by Alcon, the workshop covered advancements in phacoemulsification including complication management.



*Staff distributing awareness material during the CME on retinopathy of prematurity*

### **CME on Retinopathy of Prematurity**

Ramanathapuram, November 22

As part of observing World Prematurity Day, Retina team at Aravind-Madurai conducted the CME for Village Health Nurses (VHN) of Ramanathapuram district. Since VHNs primarily deal with the healthcare needs of women and children, educating them about RoP will, in turn, benefit the community at large. Conducted with support from District Blindness Control Society, the CME had about 90 enthusiastic VHNs and 30 Supervisors as participants.

### **Surgical Skill Transfer Course**

Aravind-Pondicherry, November 24

The course was organised for postgraduate students in ophthalmology. About 40 participated. Sessions were on trabeculectomy, phacoemulsification, penetrating keratoplasty, anterior vitrectomy and manual small incision cataract surgery.

*Participants at the Surgical skills transfer course*



*Lighting the lamp at the inauguration of the conference, Ophthalmology sans frontiers*





*Dr. Venugopal Reddy at the CME, Ophthalmology update for general practitioners*

### **Ophthalmology Sans Frontiers**

Coimbatore, December 6-8

Aravind Eye Hospital, Coimbatore organised the conference in collaboration with the University of Illinois, Chicago. Dry lab sessions, open quiz, wetlab training and didactic lectures were organised. About 320 ophthalmologists participated. The Aravind-Alcon vitrectomy training centre was inaugurated by Dr. P. Namperumalsamy, Chairman Emeritus, Aravind Eye Care System.

### **Ophthalmology Update for General Practitioners**

Aravind-Tirupati, December 15

Organised by Sri Venkateswara Aravind Eye Hospital, Tirupati and IMA, Tirupati, the interactive CME focused on diabetic retinopathy, systemic conditions and the eye, recent advances in cataract surgery, AI in healthcare and RoP. Hands-on training programmes were arranged on topics such as direct ophthalmoscope, digital fundus imaging, virtual perimetry for visual field imaging and pin touch IOP check. A total of 171 general practitioners in and around Tirupati participated.



*Dr. P. Vijayalakshmi inaugurating PASS 2020*

### **Paediatric and Strabismus Symposium (PASS 2020)**

Aravind-Pondicherry, January 4-5

The symposium had didactic lectures covering a wide variety of topics in paediatric ophthalmology as well as wetlab sessions. More than 200 delegates participated.

### **AIOS-ARC Symposium on Cataract and Glaucoma**

Aravind-Madurai, January 5

The symposium was organised by Aravind Eye Hospital, Madurai under the aegis of the Madurai Ophthalmologists Association at Hotel Courtyard Marriott. A total of 177 ophthalmologists and postgraduates participated.

### **Eye MA 2020**

Aravind-Pondicherry, January 19

The programme was conducted for the benefit of doctors other than ophthalmologists in the Indian Medical Association (IMA). A wide array of interesting topics in eye care were covered. Skill transfer courses were also conducted.

*At the AIOS-ARC Symposium on cataract and glaucoma*





## Candidates Trained 2019 - 2020

Total Candidates: 545

### POSTGRADUATE COURSES

Diploma in Ophthalmology (2 years)	8
Master of Surgery in Ophthalmology (3 years)	12
Diplomate of the National Board (3 years)	15
Post DO DNB (2 years)	25

### LONG-TERM OPHTHALMOLOGY FELLOWSHIP

Ant. Segment / Intraocular Lens Microsurgery (2 years)	14
Orbit & Oculoplasty (18 months)	8
Paediatric Ophthalmology & Strabismus (18 months)	14
Glaucoma (2 years)	15
Retina Vitreous (2 years)	23
Cornea (18 months)	26
Uvea (18 months)	1
Surgical Paediatric Retina Fellowship (RoP) (12 months)	1
Comprehensive Ophthalmology (2 years)	5
Fellowship in General Ophthalmology	29

### SHORT-TERM FELLOWSHIP (FOR INTERNATIONAL CANDIDATES)

Orbit & Oculoplasty (6 months)	2
Cornea (1 year)	1
Glaucoma (1 year)	1
Paediatric Ophthalmology (1 year)	2
Retina (1 year)	1

### SHORT-TERM CLINICAL COURSES FOR OPHTHALMOLOGISTS

Small Incision Cataract Surgery (1 month)	39
Clinical Observership Programme in Diagnosis and Management of Glaucoma (1 month)	17

Lasers in Diabetic Retinopathy Management (2 months)	39
Vitrectomy (Virtual) (2 weeks)	1
Management of Retinopathy of Prematurity & Paed. Retinal Disorders (1 month)	11
Neuro-Ophthalmology (3 months)	2
Phacoemulsification (1 month)	33

### SHORT-TERM PARAMEDICAL COURSES

Optical Dispensing (3 months)	4
OT Techniques (2 months)	6
Refraction Techniques (2 months)	10
Orthoptist (6 months)	3
Ocularist (3 weeks)	9
Fundus Fluorescein Angiography and Ultrasonography (2 months)	5

### MANAGEMENT COURSES

Management Priorities in Eye Care Delivery (1 week)	35
Management Training and Systems Development for Hospital Administrators / Managers (4 weeks)	28
Project Management training for Eye Care (4 weeks)	10
Eyexcel - Expanding Global Eye Care Workforce through Excellence in Training (4 days)	38
Management Training for Eye Care Programme Managers ( 2 weeks)	15
Community Outreach and Social Marketing of Eye Care Services (3 weeks)	13
Instrument Maintenance - for Technicians (4 weeks)	20
Training in Eye Bank Techniques (1 month)	4



## TRAINING FOR EMPLOYEES OF ALL CADRES

To improve the quality of surgical training, state-of-the-art operating microscopes were set up in the free section of Aravind Eye Hospital, Madurai with support from Global Business Services – Standard Chartered Bank.

Doctors from various Aravind centres visited prestigious eye care institutions in the US to update knowledge and get exposed to the latest treatment modalities pertaining to their area of interest.

*Dr. Amrutha Sindhu,  
Medical Consultant,  
Aravind - Coimbatore with  
Dr. Vivek Patel, Roski Eye  
Institute, Los Angeles*



*Dr. M. Purushothama  
Rajkumar, Medical  
Consultant, Aravind -  
Pondicherry with  
Dr. Paul Lee, Kellogg  
Eye Center, Michigan*

*Dr. V. Rajesh, Medical  
Consultant, Aravind -  
Pondicherry with  
Dr. Anthony J. Aldave  
Jules Eye Clinic, UCLA,  
Los Angeles*



*Dr. Sasikala Elizabeth,  
Medical Consultant,  
Aravind - Coimbatore with  
Dr. David Guyton, Wilmer  
Eye Institute, Baltimore*

In addition to the CME programmes organised for external stakeholders, Aravind regularly organises similar sessions for its doctors, Allied Ophthalmic Personnel (AOP) and staff from non-clinical departments.



*Phaco development workshop*



*Writathon - an initiative to encourage  
research publications*



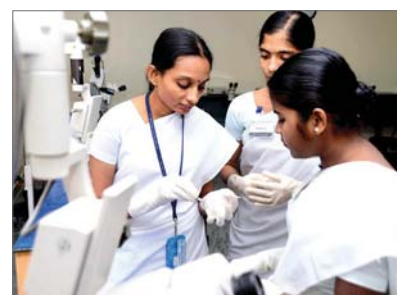
*Training for AOP*



*Vitrectomy workshop for operation  
theatre nurses*



*CME on patient counselling*



*Wetlab training*





*Care during COVID-19 crisis, with all safety measures in place*

### Allied Ophthalmic Personnel Training

Allied Ophthalmic Personnel (AOP) thus far referred to as Mid-level Ophthalmic Personnel (MLOP) comprising ophthalmic nurses, orthoptists, ophthalmic assistants/ ophthalmic technicians, constitutes a major part of Aravind's workforce. They are trained in-house for two years. Extreme care is taken to ensure that the right candidate with good attitude is recruited. A three-day workshop to standardise various systems and processes

relating to AOP recruitment, training, employment and retention was organised at Aravind-Madurai from August 1 to 3. Nursing Superintendents, HR Managers, doctors in-charge of AOP training and clinical managers from all centres participated.

Over 60% of the routine ophthalmic procedures are performed by AOP. Training programmes and evaluation sessions are regularly organised to keep them updated and thus equip them to deliver the best care. A total of 61 refractionists and 138 operation theatre technicians from across the Aravind centres were assessed under the Healthcare Sector Skill Council (HSSC) from February 18 to 26, 2020. About 14 staff from Retina investigation section underwent a systematic assessment of skills and knowledge in various investigation procedures like FFA, OCT, B-scan, ERG, EOG, VEP and MFERG.

AOPs are encouraged to attend ophthalmic conferences and present papers or posters. At the annual conference of VISION 2020 held in Chennai in July 2019, many of them won awards for best presentations.

*Senior AOPs at the annual conference of VISION 2020*



## CONFERENCES ATTENDED

Listed below are the presentations made by Aravind doctors and staff at the major national and international conferences.

### Controversies in Ophthalmology-Europe (COPHy EU)

Dublin-Ireland, from April 04-07

DR. PRERANA SHAH

- Preventing blindness due to Retinopathy of Prematurity in preterm infants using tele screening in neonatal care units

### Annual Meeting of Association for Research in Vision and Ophthalmology (ARVO 2019)

Vancouver, Canada, April 28 – May 2

DR. C. GOWRI PRIYA

- Hsa-miR143-3p regulates human corneal epithelial stem cells

DR. S. SENTHILKUMARI

- Steroid-induced ocular hypertension (SIOHT) model using human organ-cultured anterior segment (HOCAS)
- Genome-wide transcriptome profiling of human trabecular meshwork cells treated with Dexamethasone

DR. P. SUNDARESAN

- Whole exome sequencing identified rare gene variants and pathways in a large south Indian family with primary open angle glaucoma

S. YOGAPRIYA

- Quantification of human trabecular meshwork stem cells in glaucomatous donors

A. DIVYA

- Phagocytosis of *Aspergillus flavus* spores from corneal isolates by human corneal epithelial cells in vitro

DR. GANESH V RAMAN

- Biometric and gonioscopic evaluation in retinitis pigmentosa

DR. RAM RAMMOHAN

- New insights from phylogenetic analysis of *Pythium* keratitis isolates from India

### Annual Meeting of American Society of Cataract and Refractive Surgeons

San Diego, California, USA, May 3-7

DR. V.R. VIVEKANANDAN

- Piggyback phacoemulsification of Morgagnian cataracts
- Challenging scenarios in SICS

- Phaco to SICS and SICS to phaco: What both worlds can learn from each other

He was also one of the trainers in the wetlab session.

DR. SATISH KUMAR

- Big Data Big Change (video)

He also trained participants in the wetlab session

### Annual Conference of VISION 2020: The Right to Sight - India

Aravind-Chennai, June 8-9

DR. R.D. RAVINDRAN

- The role of systematic data collection and management systems in eye health

DR. V.P. RAVICHANDRAN

- Low cost airway- a carbon foot print reduction in operation room

DR. HARIPRIYA ARAVIND

- Intracameral antibiotics to reduce post op endophthalmitis

- Moderated the session, Monitoring for continuous improvement

DR. D. CHANDRASEKHAR

- Effectiveness of infection control nurse in implementing infection control practices and reducing hospital acquired infection

DR. MADHU SHEKHAR

- Under topical anesthesia the patient is uncomfortable and complaining of pain, what should I do?

DR. KARTHIK SRINIVASAN

- Artificial intelligence in diabetic retinopathy

DR. GOMATHI RAMYA

- Skill enhancement for optometrists and ophthalmic assistants

R. MEENAKSHI SUNDARAM

- One of the panelists for the session on Community outreach

SANIL JOSEPH

- Outreach camp model

B. VENGADESH

- Non visual desktop access computer training for visually impaired person

ANUSIYA A.

- Impact of an online inventory management platform on optical dispensing in vision centres

DR. PRIYANKA PARIHAR

- Prospective study to establish proportion and barriers leading to bilateral blindness due to cataract in an area of high cataract surgical rate

N.J. TAMILARASI

- Incidence and cause of significant refractive power following cataract surgery

R. MUTHULAKSHMI

- A rare case series of high myopia in full term infants

M.K. AMIRTHA VARSHINI

- Study of outcome in refractive accommodative esotropia

N. KAMATCHI

- Analysis of high retention of clinical research participants in clinical trials conducted in south Indian population

BUVANESHWARI

- Patient feedback system for remote primary eye care centres

ARUMUGA SELVI

- Analysis of surgical outcome in phacoemulsification and manual small incision cataract surgery

R. MOORTHYGOWSALYA DEVI

- Causes of suboptimal visual acuity after Toric IOL implantation – a retrospective analysis

RAJESH

- Role of systemic comorbidities on the uptake of cataract surgery among patients screened in outreach camps in the state of Tamil Nadu

S. VINOTHINI

- Making Incision on steep axis to reduce post operative astigmatism by highlighting steep axis in the A-scan sheet

Prof. Manickam taking a session on ophthalmic instruments maintenance at the annual conference of VISION 2020





**KALAIVANI KUNAL**

- To evaluate effectiveness of mini scleral contact lens in Keratoconus patient

**MARISELVI**

- Accommodative esotropia- A brief insight

**KALAIVENDAN K**

- Enhancing the quality of case finding in outreach with better instrumentation and deploying Electronic Medical Record (EMR) to ensure continuity of care.

**DR. HEMA RAJKUMAR**

- Telemedicine in retinopathy of prematurity screening in rural areas - opportunities and challenges.

**SERAN**

- To analyse the incidence of wrong refraction and wrong glass prescriptions across all Aravind Eye Hospitals by the incidents reported in the year 2018

**REVATHY K**

- Acceptance of cataract surgery from comprehensive eye camps at a new tertiary eye hospital

**HEMALATHA G.**

- High quality and timely eye care delivery in high volume work place camp

**R. RAMYADEVI**

- Outcomes of telescreening for RoP in rural south India – The Aravind - Coimbatore experience

**S. SANGEETHA**

- Impact of benchmarking in field of ophthalmology
- Study on effectiveness of training provided for administrative staff in eye care hospital

**M. MURUGESAN**

- Effective dispensing of maximum number of low cost spectacle in a mega outreach camp

**RAJAKUMARI**

- Improving cataract surgery acceptance rate by utilising multiple tools during cataract counselling

**R. GAUTHAM KUMAR**

- To study the effectiveness of mandatory committees in implementing quality standards and improving hospital functioning part of advocacy

**B. VIGNESH**

- Gender inequalities study in comprehensive outreach eye camp in south India

**ABINAYA**

- Ideas to manage waiting time

**14th meeting of European Neuro-Ophthalmological Society (EUNOS)**

Porto, Portugal, June 16-19

**DR. KOWSALYA BALAJI**

- Traumatic optic neuropathy

**Global Ocular Inflammation Workshops 2019**

Sapporo, Japan, June 27-30

**DR. S.R. RATHINAM**

- One of the panelists for the International workshop on Vogt-Koyanagi-Harada Syndrome and Sympathetic ophthalmia.

**26th ARVO-India | IERG 2019**

Chennai, July 26-28

**PROF. K. DHARMALINGAM**

- Chaired, Dr. Venkat Reddy Oration Lecture

**PROF. VR. MUTHUKKARUPPAN**

- Biology of the adult human ocularstem cells and their importance in health and disease of the eye.

**DR. S. SENTHILKUMARI**

- Dexamethasone-induced ocular hypertension (DEX-OHT) in Indian donor eyes under perfusion culture

**DR. P. SUNDARESAN**

- POAGome: Genes associated with primary open angle glaucoma

**DR. C. GOWRI PRIYA**

- miRNA regulating limbal epithelial stem cells

**A. DIVYA**

- Proteomic analysis of *Aspergillus flavus* infected human corneal epithelial cell phagosomes

**C. PRAKASH**

- Investigation of nuclear gene involvement in LHON pathogenesis

**O. RUTHRA**

- Surface proteome and surface morphology of melanised and non-melanised conidiospores of *Aspergillus flavus*

**KRP. NIRANJANA**

- Quantitative profiling of tear proteome reveals down regulation of Zinc alpha-2 glycoprotein in *Aspergillus flavus* keratitis patients

**D. IRENE**

- Molecular mimicry between leptospiral antigen and human lens proteins: A possible trigger for cataract formation in leptospiral uveitis patients

**P. SARANYA**

- Characterisation of adult tissue resident stem cells in the human anterior lens epithelium

**K. SARASWATHI**

- Clinical and genetic analysis of ocular adnexal lymphoma

**K. JEYAPRAKASH**

- Investigation of human papillomavirus in non-familial retinoblastoma patients

**P. GOWRI**

- Molecular genetics of mitochondrial genes associated with Leber's Hereditary Optic Neuropathy (LHON)

**ANINDITA RAO**

- Meta-analysis of microarray data reveals dysregulated cancer pathways in retinoblastoma

**A. S. SRIEE VISWARUBHINY**

- Whole exome sequencing in two family trios with Leber's Congenital Amaurosis

AMRF team at IERG conference



Dr. Kowsalya Balaji at EUNOS conference



#### M. DURGA

- Immunophenotypes of macular corneal dystrophy in Indian population

#### R. SIVAGANESA KARTHIKEYAN

- Genotyping and phylogenetic analysis of Ribosomal nuclear subunit (Rns) in *Acanthamoeba* spp. causing keratitis

#### A. SELVA PANDIAN

- Evaluation of direct polymerase chain reaction, conventional PCR and q-PCR methods with that of gold standard culture method for the diagnosis of infectious endophthalmitis

#### G. RAMESH KUMAR

- Epidemiology and molecular identification of *Nocardia* spp. causing Endophthalmitis by multi locus sequence analysis (MLSA)

#### Indian Intraocular Implant & Refractive Surgery Convention

Chennai, India, July 6-7

##### DR. RAJESH

- 3D printer in ophthalmology (video)

##### DR. SATISH KUMAR

- SICS in brown cataract
- Special mention award (video)

#### Annual Meeting of American Society of Retina Specialists

Chicago, Illinois, USA, July 26-30

##### DR. NARESH BABU

- Scleral plug for treatment of OD PIT
- Takayasu retinopathy (case presentation)
- 2 stage surgery (video)
- Tips and tricks of vitrectomy (video)

##### DR. ADITYA MAITRAY

- Intravitreal Raxumab in macular pathology

##### DR. ANAND RAJENDRAN

- Efficacy of subthreshold yellow micropulse laser green laser for central serous chorioretinopathy

##### DR. KARTHIK SRINIVASAN

- A novel adapter for light probe as a chandelier

#### TEDx Napier

Chennai, August 11

##### DR. R. KIM

- Artificial intelligence in diabetic screening.

#### TEDx NITTrichy

Trichy, December 9, 2019

##### DR. P. NAMPERUMALSAMY

- How to establish sustainable social business

#### International Society of Genetic Eye Diseases and Retinoblastoma (ISGEDR)

Giessen, Germany, August 29-31

##### DR. PARAG K SHAH

- Gene testing from blood samples of 113 retinoblastoma survivors and their families (398 in total) collected on a single day at Aravind Eye Hospital, Coimbatore, India

#### 19th Euretina Congress

Paris, France, September 5-8

##### DR. T. P. VIGNESH

- Eplerenone for the treatment of chorionic CSCR with CME

##### DR. PANKAJA

- Sub-tenon's versus retrobulbar anesthesia in vitreo-retinal surgeries: A prospective randomised study
- Case series of ocular toxoplasmosis in a tertiary eye care centre in India

##### DR. GEORGE MANAYATH

- Post PDT acute exudative maculopathy
- Non proliferative macul 2 with SFD response to Anti VEGF

##### DR. PRATIK SHAH

- CRAO in young post FESS

- Case series of 6 patients with adult onset Coat's disease

##### DR. ANAND RAJENDRAN

- Conquering complex surgical scenarios - Pearls and pitfalls.
- Tackling PVR: peripheral and posterior
- Expulsive hemorrhage - early detection and management

#### Oculoplastics Association of India Conference (OPAI – 2019)

Guwahati, September 6-8

##### DR. USHA KIM

- Performed 3D live surgery using frontalis sling
- Eyelids: Tips and tricks in different types of ptosis surgeries
- Ptosis and eyelids frontalis sling surgery – My techniques
- Judge – Dr. Raman Mittal Free Paper session
- Panelist – Medicolegal aspects in oculoplasty

##### DR. JAYAGAYATHRI

- Incidence of speculum related blepharoptosis in patients undergoing phacoemulsification.
- Revisiting Jacksons and Lee's classification of neurofibromatosis- a spectrum.

##### DR. DAYAKAR YADALLA

- Blocks in oculoplasty (video)

##### DR. VIJI RANGARAJAN

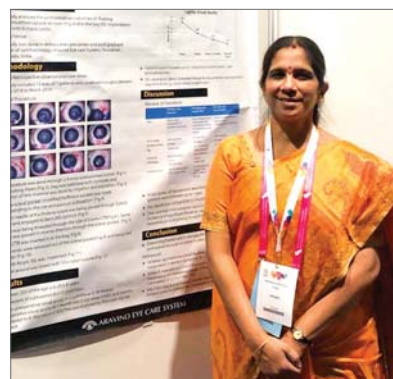
- Rare case of alveolar soft part sarcoma of orbit
- A novel approach to management of severe facial disfigurement in Neurofibromatosis type 1

##### DR. KAVITHA YUVARAJAN

- Rare orbital tumour
- Catch the worm before it traps you

##### DR. JAYAGAYATHRI

- VAST - Fornix deepening sutures
- External dacryocystorhinostomy with intubation



Dr. R. Meenakshi at the ESCRS conference

##### DR. MANEKSHA

- Interesting orbital foreign bodies

#### Eucornea Congress

Paris, France, September 13-14

##### DR. ANITHA RAGHAVAN

- Co-infections in *Acanthamoeba* keratitis - the hidden story

#### Annual Conference of European Society of Cataract and Refractive Surgeons (ESCRS)

Paris, France, September 14-18

##### DR. KALPANA NARENDRA

- Secondary lens implantation techniques

##### DR. R. MEENAKSHI

- Paediatric Keratoconus – A study on epidemiology and treatment outcome
- Difficult situations in paediatric cataract surgeries (at the World Society of Paediatric Ophthalmology and Strabismus sub-speciality day)
- Cionni capsular tension ring and in the bag placement of IOL in cases of ectopia lentis – a case series

##### DR. SANDRA GANESH

- What's new in paediatric cataract?
- Scleral - fixated introocular lens in children
- Single stage adjustable strabismus surgery (at the World Society of Paediatric Ophthalmology and Strabismus sub speciality day)

##### DR. ASHOK VARDHAN

- High cataract surgical rate and universal eye care delivery model bringing elimination of cataract blindness in Theni district, India.

##### DR. SATHYA RAVILLA

- Intra-trochlear steroid injections in acquired Brown's Syndrome- A case series
- Toric and multifocal lens implants in children

#### GlaucoKnow 2019 – Annual Conference of Glaucoma Society of India

Lucknow, September 20-22

##### DR. R. RAMAKRISHNAN

- Chaird the session, Basics of glaucoma diagnosis



- Mentor for the instruction course, Managing complications of Trabeculectomy confidently
- Does evidence justify selective laser trabeculoplasty in Indian eyes
- Roads travelled by glaucoma experts

DR. S.R. KRISHNADAS

- Ocular hypotony and bleb revision following glaucoma filtering surgery

DR. GEORGE VARGHESE PUTHURAN

- Tubes in complex situations

DR. MOHIDEEN ABDUL KADER

- Managing late post-operative complications
- Trabeculectomy after SICS

DR. R. VENKATESH

- Chaired the instruction course, Managing complications of trabeculectomy confidently
- Evidence based glaucoma care – glaucoma care driven by artificial intelligence

DR. R. SHARMILA

- Interpretation of OCT
- Tube complications
- Is early surgery a risk to QOL?

DR. S. KAVITHA

- Glaucoma after scleral buckling and vitreo retinal procedures
- All that you want to know about tubes
- Corneal endothelial cell density changes 6 months after laser peripheral iridotomy: A prospective study.
- 3D click-art exhibition- A novel approach to create glaucoma awareness

DR. SWATI UPADHYAYA

- Validation of a head mounted virtual reality visual field screening device
- Managing complications of trabeculectomy confidently

DR. VISHWARAJ

- Impact of sibling motivational cards in family screening- randomised trial

DR. KEERTI GAYAM

- Evaluation of central corneal thickness in children using contact and non-contact techniques
- Refusal for fellow eye combined surgery after first eye combined surgery-reasons

DR. MEGHA

- A prospective study to evaluate the reasons for hospital visit among patients with primary glaucoma
- Lens induced glaucoma-why so late??

DR. HIRUNI

- Endothelial cell loss in nanophthalmic eyes undergoing phacoemulsification surgery
- Comparative study of the outcomes of inferonasal AuroLab aqueous drainage implant surgery to superotemporal implant placement.

DR. SHILPA

- Histopathological and clinical correlation using light microscopy in nanophthalmic eyes

DR. SUBATHRA

- Efficacy and safety of NPDS in advance glaucoma

DR. GANESH V RAMAN

- Dry lab- optic disc and fields
- Managing congenital glaucoma- Newer techniques
- Talk on EMR

DR. VINOTH ARUNACHALAM

- Safety and efficacy of selective laser trabeculoplasty following deep anterior lamellar keratoplasty

DR. NEETHU MOHAN

- Wound exploration for hypotony – 2 case scenarios (video)

DR. PREETHI

- Ultrasound Biomicroscopy (video)

DR. ADITYA MAHADEVAN

- Secondary ocular hypertension following intravitreal injection of 2mg triamcinolone acetate (poster)

### Annual Conference of Asia Pacific Tele Ophthalmology Society (APTOS)

Chennai, September 21

DR. R. KIM

- AI in clinical workflow

THULASIRAJ RAVILLA

- AI – Solving today's problems and opening new frontiers: Round table discussion
- Leveraging AI for universal eye health

B.S. GANESH BABU

- Technology driven primary eye care

SANIL JOSEPH

- Validation of retinal image grading results by a trained non-ophthalmologist grader for detecting diabetic retinopathy in southern India

DR. PARAG K SHAH

- Tele screening for RoP

DR. SIVARANJANI

- Offline artificial intelligence in the screening of DR

### World Congress of Paediatric Ophthalmology and Strabismus

Paris, France, September 13

DR. SANDRA GANESH

- Single stage adjustable strabismus surgery

### Annual Conference of Uveitis Society of India (USICON)

Bengaluru, September 20-22

DR. S.R. RATHINAM

- Sun classification
- SSPE what we are going to do



Dr. S.R. Rathinam at USICON

- Holistic approach in uveitis
- Uvea rheumatology interspace

DR. S. BALAMURUGAN

- Convenor of the session on non-Infectious Uveitis

DR. ANURADHA

- Challenging cases

DR. ANJANA S.

- Efficacy and safety of posterior subtenon's triamcinolone acetonide, intravitreal triamcinolone acetonide, intravitreal dexamethasone implant (OZURDEX) and intravitreal bevacizumab (Avastin) for the treatment of uveitic macular edema

DR. VEDHANAYAKI

- Challenges in VKH case presentation

JEYAKOHILA

- Exploring cause for lost follow up at uvea clinic

### 11th National Conference on Cornea and Eye Banking

Bangalore, September 28

DR. M. SRINIVASAN

- Indian eye banks: present and future

DR. ANITA RAGHAVAN

- Acanthamoeba keratitis
- Unusual keratitis

D. SARAVANAN

- Successful donor corneal collection model in Aravind Eye Banks, India

DR. ANITA RAGHAVAN

Moderated the sessions on

- CXL practical guidelines
- Solve the puzzle
- Acanthamoeba Keratitis
- Unusual keratitis

### National symposium on Low Vision Care and Rehabilitation

Chennai, September 28-October 1

DR. SAHITHYA. B

- Early intervention and vision rehabilitation



Dr. B. Sahithya at Low vision forum



Aravind team at the annual conference of AAO

### Symposium of International Society for Clinical Electrophysiology of Vision

Seoul, South Korea, October 5-10

DR. RUPA

- Warburg Micro Syndrome Type 4: A case report

### 3rd Executive Summit of Siemens Healthineers

Amsterdam, Netherlands, October 7-8

DR. S. ARAVIND

- Transforming care delivery: Is better always more expensive?

### Driving Innovation: Technology and India's Rise as a Global Power

North Carolina, USA, October 10

- Mr. Thulasiraj Ravilla, Executive Director, LAICO participated in the panel discussion on Public Health/ Technology.

### Annual Conference of American Society of Ophthalmic Plastic & Reconstructive Surgery

San Francisco, USA; October 10-11

DR. USHA KIM

- Orbital diseases spectrum in India

### 10th International Low Vision Forum

Beijing, China, October 11

DR. SAHITHYA

- Vision Rehabilitation for children with special needs

### Annual Conference of American Academy of Ophthalmology (AAO)

San Francisco, USA, October 12-16

DR. R. VENKATESH

- Manual ECCE Surgery: Indications and techniques – Instruction course
- Resolution of visual dysphotopsias following laser iridotomy: 6 month follow-up (e-Poster)

- Routine fundus photography screening for posterior segment disease: A stepped-wedge, cluster-randomized trial in South India (e-Poster)

DR. SASIKALA ELIZABETH

- MSICS course-Steps of surgery

DR. R. REVATHY

- Therapeutic keratoplasty - Management of recalcitrant microbial keratitis
- Medical management of Acanthamoeba keratitis - IC Diagnosis and management Acanthamoeba keratitis
- Comparison of accelerated collagen cross linking (CXL) for 10 minutes and standard (CXL) in paediatric keratoconus (Original paper)

DR. USHA KIM

- Experience adopting Aravind based research to the US – Barriers.

DR. RAJESH.V

- 3D printing in ophthalmology (vidco)
- Resident's learning curve analysis for manual small incision cataract surgery using ICO-OSCAR tool

DR. PURUSHOTHAMMA RAJKUMAR

- Innovations in wet lab training (video)

Dr. R. Kim and Dr. Haripriya Aravind participated in the conference.

### SEVA Synergy Series

California, USA, October 17

- Mr. Thulasiraj Ravilla participated and shared inputs at the session, Leadership: The engine for change.

### WHO SEARO Expert Group Meeting Meeting on Preventing Glaucoma Blindness in South East Asia

New Delhi, November 21-23

- Mr. Thulasiraj Ravilla participated at the meeting and shared inputs.

### Comprehensive Cataract Conference 2019

Kolkatta, November 29 - December 01

DR. R.D. RAVINDRAN

- Role of manual small incision cataract surgery in enabling high volume – quality cataract surgery

- Be effective as a leader

DR. SHIVKUMAR CHANDRASHEKHARAN

- Comparison of astigmatism: temporal vs superior tunnel with sutures in manual small incision cataract surgery

DR. MADHU SHEKHAR

- Visual outcomes of cataract surgery following refractive surgery using ASCRS average method
- Video: Iridodialysis repair- simplified approach

DR. ARAVIND SRINIVASAN

- Live surgery : SICS/ Phaco
- Profitability: fixing the leaks

THULASIRAJ RAVILLA

- Outgrowing your practice
- How to get a great team
- Summary: Essential mindsets

DHIVYA RAMASAMY

- Patient loyalty

BALASUBRAMANI R

- Getting rid of everyday fire-fighting

### Annual Conference of Asia Pacific Vitreo-Retina Society (APVRS 2019)

Shanghai, China, November 22 – 24

DR. NARESH BABU

- Scleral plug in optic disc pit maculopathy

DR. OBULI RAMACHANDRAN

- Dome shaped maculopathy-Retrospective analysis

DR. SYED MOHIDEEN ABDUL KADER

- Triple treat to a trauma
- Supplical outcome of FTMH in IJT





Dr. Madhu Shekhar at the Comprehensive cataract conference

### Annual Meeting of Indian Neuro-ophthalmology Society

New Delhi, November 30-December 1

DR. MAHESH KUMAR

- Evaluation of a case of optic disc oedema in the young

DR. PADMAVATHY

- Panelist - Ophthalmoplegia beyond nerve and muscles

### First Meeting of the Glaucoma Society of Nepal

Nepal, December 2-7

DR. R. VENKATESH

- Aravind Model of glaucoma care

### Annual Conference of Vitreo Retina Society of India (VRSI)

Lucknow, December 5-8

DR. R. KIM

- Co-chair for the session, The Buckle symposium
- Co-chair for the session, The top 7 lessons learnt in diabetic macular edema management
- Basic steps of scleral buckling: Getting it right

DR. NARESH BABU

- Getting out of jail - Managing surgical complications / complicated situations
- Moderator for Advanced VR surgery Part 2
- Optic disc pit - maculopathy - management methods

DR. VIGNESH T.P

- Hyper -imaging by OC(T)can's twelve: Multilayered PED

DR. KARTHIK KUMAR

- Surgical drainage of choroidal effusion using trochar with cannula - An effective and easy way
- Wetlab- EYESI simulator



Dr. Karthik Kumar, Dr. Renu P Rajan at the annual conference of VRSI

DR. RENU P RAJAN

- Quantification of relative afferent pupillary defect (RAPD) by automated pupillometer and its relationship with AMD dimensions and visual acuity
- Hyper -imaging by "OC(T)can's Twelve" - focal choroidal excavation

DR. JAYANT

- Comparison of non-mydratic ultra wide field fundus images by OPTOS and CLARUS and its association with pupillary size and reaction

DR. PIYUSH

- Comparison of various surgical techniques for optic disc pit maculopathy

DR. ADITYA MAITRAY

- Endogenous serum cortisol levels and anxiety assessment in patients with polypoidal choroidal vasculopathy(PCV): A new insight into pathogenesis

DR. CHITARANJAN MISRA

- Incidence and outcomes of endophthalmitis with prefilled intravitreal bevacizumab injections: a multicentric prospective study

DR. SOUMYA JENA

- Comparison of outcomes of PPV in rhegmatogenous retinal detachment cases using 3D visualisation system versus analog microscope

DR. ANIRBAN

- Subthreshold micropulse yellow laser and eplerenone drug therapy in chronic central serous chorioretinopathy patients: A comparative study

DR. SOURAV

- Indigenous low cost heads up vitrectomy simulator

DR. VEDHANAYAKI

- Challenges in paediatric uveitis
- Viral infection

DR. ROSHNI, DR. AYSHWARIYA

- A case of retrobulbar optic neuritis



Dr. K. Naresh Babu at the APVRS conference

complicated by CSCR following IV steroid therapy

DR. MANAVI D SINDAL

- Subjective high risk patient randomisation project

DR. V.R.SARAVANAN

- Workshop on Eye SI VR Simulator
- Surgical management of tough ERM

DR. GEORGE MANAYATH

- Workshop on PDT
- Current role and relevance of PDT therapy in AntiVEGF

DR. ANAND RAJENDRAN

- CSCR - Phantom pathology
- Multicolour imaging in macular pathologies

DR. RITESH CHAINANI

- Case series of PAMM

### Annual Conference of Indian Paediatric Glaucoma Society

Hyderabad, December 7

DR. HIRUNI

- A lost battle- Challenging case
- A comparative study of the glaucoma drainage surgery in children and adults

DR. SRILEKHA

- A case of unilateral congenital glaucoma associated with microcephaly and ipsilateral hemiplegia

DR. A. VIJAYALAKSHMI

- Sturge Weber syndrome with klippel Trenaunay syndrome
- Bilateral congenital ectropion uveae with buphthalmos managed by simultaneous trab and trab
- Phakomatosis pigmentovascularis type IIb (phakomatosis caesiophlammea) with congenital glaucoma- A rare case report

DR. PRIYANKA

- Frank - Ter Haar Syndrome with congenital glaucoma in a sibling pair - A rare case report



Dr. S. Aravind at the Conference on advances in healthcare management services



Dr. Haripriya at the annual meeting of Ophthalmological Society of Taiwan

**DR. PRIYANKA SHYAM**

- Corneal ulcer following bilateral congenial glaucoma surgery: A case report (e-poster)

**Synergy 2019 – Annual Conference of Strabismus and Paediatric Ophthalmology Society of India**  
Chennai, December 7-8

**DR. VIDHYA KHOBRAGADE**

- Siblings with gyrate atrophy presenting with cystoid macular edema

**DR. MAHIMA**

- Normative data of paediatric OCT in south Population
- Study on Regaining Binocularity in unilateral traumatic cataract

**DR. ANJALI KHADIA**

- Eye screening for mentally challenged children with portable vision screening
- Real time OCT incorporated in the operating microscope during paediatric cataract surgery

**IAPB South East Asia Eye Health Experts meeting**

Kathmandu, Nepal, December 9-12

- Mr. Thulasiraj Ravilla attended the meeting and shared inputs.

Mr. Thulasiraj Ravilla at the meeting of researchers - defining the research agenda for Velux Stiftung



**60th Annual Meeting of the Ophthalmological Society of Taiwan**  
Taipei, Taiwan, December 13-15

**DR. HARIPRIYA ARAVIND**

- Tips and tricks to apply on a patient with a hard lens or white cataract
- Sharpen surgical skills: Managing posterior polar cataracts and subluxated lenses
- Managing challenging cases with advanced phaco technology

**Keracon - Annual Conference of Cornea Society of India**

Kumarakom, December 13-15

**DR. R. REVATHY**

- Keratoplasty & Viral keratitis

**DR. JOSEPHINE CHRISTY**

- Donor characteristics and tissue utilisation in tertiary eye bank.
- Wetlab trainer for DMEK skill transfer course

**DR. KUNAL**

- Anxiety - A silent battle (video)
- A rare case of scytalidium keratitis

**DR. NAVEEN**

- Literature review in aqueous deficiency dry eye.
- Recycled intralase patient interface for DMEK wet lab training

- Comparison of donor characteristics of corneas collected through hospital corneal retrieval program and voluntary eye donation
- Co-ordinator of the session: Dry eye – ATD
- Photo contest: Drug deposit on endothelium
- Photo contest: Archipelago of epithelium

**DR. SIKHA MISRA**

- Fungal load analysis on repeat scrapping of fungal keratitis patients treated with topical natamycin vs topical natamycin + voriconazole
- Posterior polymorphous corneal dystrophy - A tertiary centre case series report (e-poster)

**DR. ANITA**

- Role of goretex in ocular surface reconstruction

**Annual Meeting of Philippines Academy of Ophthalmology**

Manila, Philippines, December 5-7

**DR. N. VENKATESH PRAJNA**

- Mycotic Ulcer Treatment Trials - Lessons learnt

**DR. LALITHA PRAJNA**

- Future of diagnostics in infectious keratitis

**Workshop: Hotspots in ophthalmology research targeting needs in low - and middle-income countries**

Zurich, Switzerland, January 15-19

At the workshop organised by Velux Stiftung, Mr. Thulasiraj Ravilla participated in the plenary session on What is needed for a sustainable change? and provided inputs based on the Aravind model.

**5th International Conference on Advances in Healthcare Management Services**

IIM-Ahmedabad, February 14-16

Dr. S. Aravind, Chief Medical Officer, Aravind-Chennai delivered the keynote address.



## In the Spirit of Service Beyond Eye Care

Beyond eye care, Aravind often involves in philanthropic activities benefitting the socially and economically disadvantaged sections in the community. One such initiative is the Residents Social Responsibility programme, which has become a structured activity happening across the centres every year. Through this, Aravind's postgraduate residents are encouraged to help alleviate the sufferings of the lesser privileged, beyond the realm of medicine. Apart from providing monetary support to the needy, the activities include providing free tuitions to children at orphanages, distributing toys and study materials and spending time with the inmates at old age homes.



*Sale organised to support visually challenged women to sell their products*



*At a children's orphanage*



*Eye examination at a school for special children*

## ARTICLES PUBLISHED IN PEER-REVIEWED JOURNALS

Prajna NV, Srinivasan M, Mascarenhas J, Lalitha P, Revathi R, McClintic SM, O'Brien KS, Ray KJ, Acharya NR, Lietman TM, Keenan JD.

*Visual impairment in fungal versus bacterial corneal ulcers 4 years after successful antimicrobial treatment.*

Am J Ophthalmol. 2019 Aug;204:124-129.

Kantipuly A, Manju Pillai R, Sujani S, Rakhee K, Ganesh V Raman, Krishnadas R, Robin AL, Ehrlich JR.

*Caregiver burden in primary congenital glaucoma.*

Am J Ophthalmol. 2019 Sep;205:106-114.

Varghese Puthuran G, Palmberg P, Kaushalya Wijesinghe H, Saurabh Srivastav K, Ramasamy Krishnadas S, Lee Robin A.

*Aurolab Aqueous Drainage implant with and without Scleral patch graft in refractory adult and pediatric glaucomas – A comparative study.*

Am J Ophthalmol. 2020 Mar 25. [Epub]

Pickel J, Narayana S, Krishnan T, Ramakrishnan S, Samantaray PP, Porco TC, Redd T, Lietman TM, Rose-Nussbaumer J.

*The Prognostic Value of Persistent Culture Positivity in Fungal Keratitis in the Mycotic Antimicrobial Localized Injection Trial.*

Am J Ophthalmol. 2020 Mar 11. [Epub]

Sivakumar P, Palanive S, Gochait D, Hess O.

*Diagnostic challenges in a case of an isolated third nerve palsy.*

Am J Ophthalmol Case Rep. 2020 Jan 30;18:100585.

Rathinam SR, Vedhanayagi, Balagiri S, Priya S.

*A cross sectional assessment of knowledge, attitude and practice towards Leptospirosis among rural and urban population of a South Indian District.*

Biomed J Sci & Tech Res. 2019;16(2):1-14.

Manoj Kumar K, Uma Subramanian, Bharanidharan D.

*Performance assessment of variant calling pipelines using human whole exome sequencing and simulated data.*

BMC Bioinformatics. 2019 Jun 17;20(1):342.

Kannan NB, Sen S, Ramachandran O, Ramasamy K.

*Management of coexistent choroidal neovascular membrane and macular hole with serous detachment in a case of pathological myopia: challenges and dilemmas.*

BMJ Case Rep. 2020 Mar 30;13(3). pii: e234051.

Durr NJ, Dave SR, Lim D, Sanil Joseph, Thulasiraj RD, Lage E.

*Quality of eyeglass prescriptions from a low-cost wavefront autorefractor evaluated in rural India: results of a 708-participant field study.*

BMJ Open Ophthalmol. 2019 Jun 14;4(1): e000225.

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- George J Manayath, Ratnesh Ranjan, Nagesha CK, Narendran V. *Non-proliferative type II macular telangiectasia variant with subfoveal detachment: role of anti-VEGF therapy.* Br J Ophthalmol. 2019 Dec 2. [Epub]
- Naresh Babu, Girish Baliga, Hiruni KW, George V Puthuran. *Intermediate-term outcomes of pars plana tube insertion of Aurolab aqueous drainage implant for refractory glaucoma.* Br J Ophthalmol. 2019 Dec 3. [Epub]
- Babu N, Kohli P, Ramasamy K. *Comparison of various surgical techniques for optic disc pit maculopathy: vitrectomy with internal limiting membrane (ILM) peeling alone versus inverted ILM flap 'plug' versus autologous scleral 'plug'.* Br J Ophthalmol. 2020 Feb 6. [Epub]
- Naresh Babu K, Piyush Kohli, Soumya Jena, Kim R. *Utility of digitally assisted vitreoretinal surgery systems (DAVS) for high-volume vitreoretinal surgery centre: a pilot study.* Br J Ophthalmol. 2020 Mar;104(3): 432-436.
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## Congratulations Authors...

### JAMA - One of the top 10 articles of the decade (2010 – 2019)

Gulshan V, Peng L, Coram M, Stumpe MC, Wu D, Narayanaswamy A, Venugopalan S, Widner K, Madams T, Cuadros J, Kim R, Raman R, Nelson PC, Mega JL, Webster DR. *Development and Validation of a Deep Learning Algorithm for Detection of Diabetic Retinopathy in Retinal Fundus Photographs*. JAMA. 2016 Dec 13;316(22):2402-2410. doi: 10.1001/jama.2016.17216.

### Obstbaum Award for Best Paper in JCRS 2019

Haripriya A, Chang DF, Ravindran RD. *Endophthalmitis reduction with intracameral moxifloxacin in eyes with and without surgical complications: Results from 2 million consecutive cataract surgeries*. J Cataract Refract Surg. 2019 Sep;45(9):1226-1233. doi: 10.1016/j.jcrs.2019.04.018. Epub 2019 Jul 29.

### AIOS-IJO Silver Award 2020

Sara SH, Prajna NV, Senthilkumari S. *Human amniotic membrane as a drug carrier - An in-vitro study using fortified cefazolin ophthalmic solution*. Indian J Ophthalmol. 2019;67(4):472-475. doi:10.4103/ijo.IJO\_1336\_18

### One among the 10 Most Downloaded Papers in Ophthalmic & Physiological Optics during January 2018 - December 2019

Joseph S, Krishnan T, Ravindran RD, Maraini G, Camparini M, Chakravarthy U, Ravilla TD, Hutchings A, Fletcher AE. *Prevalence and risk factors for myopia and other refractive errors in an adult population in southern India*. Ophthalmic Physiol Opt. 2018 May;38(3):346-358.



# Consultancy and Capacity Building

*LAICO continues to expand its capacity building initiatives - currently engaged in mentoring 43 eye hospitals across the world. With the support of funding partners, it is able to enhance the productivity and quality of care in these hospitals. In recent years, LAICO's focus has been to advocate for and spread the vision centre model across the Indian subcontinent. Proven to be a cost-effective approach to achieve universal eye care coverage, Aravind vision centres provide an ideal primary eye care delivery model for the developing world. LAICO has packaged this sustainable and scalable model to support governments and NGOs in replicating its impact. Another important thrust area for LAICO has been health services research and publication aimed at generating evidence for best practices in eye care delivery. As a result, the number of research publications has considerably increased and there are around ten health services research projects currently underway.*

## Consultancy and Capacity Building Programmes

### African Centres of Excellence in Cataract Surgical Services (ACCESS) Phase II

The twin aim of this project is to improve cataract surgical rate in Sub Saharan Africa as well as the visual outcomes. As part of this, teams from LAICO and Aravind have been making regular visits for on-site mentoring to all the five participating hospitals. In response to a request from Kitwe Central Hospital in Zambia, Dr. V. Raghuram, Cornea Consultant, Aravind-Madurai made a special trip and spent three weeks in August 2019 to train their residents in small

incision cataract surgery, microsurgery and post-operative management. At the performance review meeting conducted during April 11-15, 2019 in Dubai, each hospital presented its annual performance against the target set, as well as the goals for the upcoming year. Each element of the presentation was analysed and discussed in detail, leading to recommendations for action to further improve the performance. The five participating hospitals had performed 12,860 cataract surgeries. This translates to 6,259 additional cataract surgeries, which is a 95% increase from the baseline. Considerable improvement was also achieved in post-operative visual outcomes. Visual acuity of 6/18 or better, averaged 61.6% in the baseline year and this improved to 77.7%, falling just a bit short of the 80%

*Participants of ACCESS review meeting*





*Dr. V. Raghuram with Kitwe Eye Hospital, Zambia team*

goal with available correction, set by WHO. In order to establish the long-term visual outcomes, something desired by all the hospitals, an independent assessment was carried out on 50 randomly selected cataract operated patients from each hospital. This assessment was done by Dr. John Anhalt (Academic Global Ophthalmology - Wills Eye Hospital) and Dr. Joseph L. Licht (Emory Global Ophthalmology Fellow). Overall 88% of the patients had a best-corrected visual acuity of 6/18 or better in the operated eye.

### **Strengthening Capacity and Learning to Effectively Deliver Quality Eye Care (SCALE)**

The capacity building project funded by Seeing is Believing (SIB), through Seva Foundation started in 2016 and ended in December 2019. The total annual performance in 2019, of all 13 mentee hospitals was 103,109 cataract surgeries. This represents a 45% increase from their baseline cataract surgeries of 32,046. LAICO organised a performance review meeting involving all the active mentees at PBMA's H.V. Desai Eye Hospital, Pune from July 5 to 6, 2019. A total of 25 participants from 9 hospitals attended the meet. With support from SEVA Foundation, LAICO also conducted an online survey on the effectiveness of the mentoring process involving six mentor hospitals and 56 mentees associated with the project.

SCALE mentors' meeting was organised at LAICO on September 29, 2019. Representatives from all six mentor hospitals participated. The meeting discussed the way forward in making the vision of Global Sight Initiative a reality. This was done in conjunction with the October Summit event "Enhancing Eye Care through Effective Mentoring" organised by LAICO.

### **Enhancing Eye Care Services in the Indian Subcontinent**

The capacity building initiative supported by Lavelle Fund for the Blind ended in 2019. The project aimed to help 25 eye hospitals in the Indian sub-continent to enhance their efficiency and quality, thus optimising their capacity. This would make them financially sustainable as well as proactively address the community's eye care needs. For the calendar year 2019, these hospitals, from India and Bangladesh, collectively performed 108,415 cataract surgeries. This works out to 39,578 additional surgeries-a 57% increase from the baseline. Throughout the project period, all these partner hospitals benefited from LAICO's strategic guidance, periodic review, yearly benchmarking meetings, access to Aravind's training programs, IT support and onsite visits.

### **Supporting Free Cataract Surgeries**

As part of the World Sight Day commemoration, SEVA Foundation through LAICO supported 2,100 free cataract surgeries performed by seven of LAICO's mentee eye hospitals in SEVA Global Sight Initiative network.

### **LEAP: Together Towards Excellence - A Collaborative Series**

The first series in LEAP focusing on enhancing cataract surgical intervention rate amongst the paying walk-in patients ended in September 2019. The goal was to ensure that all those who will benefit from cataract surgery, end up getting it. The year-long collaborative work showed that the intervention rate, i.e. the cataract surgeries as a proportion of outpatients, went up significantly in hospitals that were able to implement the improvement strategies. Overall, the participating hospitals were able to increase the intervention rate resulting in a total 1,711 additional cataract surgeries.

In July 2019, the second collaborative was rolled out with a focus to enhance the efficiency of outreach services. Three hospitals enrolled in this series and two learning sessions were conducted, in June and December respectively. Within the first 3 months of engagement in this collaborative, the average outpatients per camp increased by 18% and surgeries by 12% compared to the baseline of 133 outpatients and 26 surgeries respectively. Because of this enhanced efficiency, even with the same number of camps, the hospitals surpassed the baseline volumes.



## Developing Eye Hospitals in Northern India

LAICO was honoured by the visit of Shri. Suresh Kumar Khanna senior Cabinet Minister of Govt. of Uttar Pradesh (UP) for Finance, Parliamentary Affairs and Medical Education. He and the government team that accompanied him studied the caregiving operations of Aravind at the community, secondary and tertiary levels as well as gained an in-depth understanding of the training programmes for Allied ophthalmic Personnel (AOP) and ophthalmologists. The purpose was to see how the effective eye care delivery of the Aravind model could be replicated in Uttar Pradesh. This whole cross-learning exercise was facilitated by Shri. Rajeev Agarwal, an entrepreneur from UP, with operations both in India and the US.

Considering the huge eye care needs in Uttar Pradesh and to address the backlog of blindness, LAICO, at the request of Shri. Rajeev Agarwal, proposed a special initiative to build the capacity and capability in willing eye hospitals in UP. As a first step towards this, a meeting was organised at Sitapur Eye Hospital, on January 11 to understand the willingness to be part of this initiative of Sitapur branch eye hospitals that were invited to this meeting. Representatives from 10 branch hospitals of Sitapur, LV Prasad Eye Institute and programme managers from INGOs like SightSavers International and Christoffel Blinden Mission participated in this meeting. While all showed interest, four hospitals from this cohort were identified to be mentored by LAICO, in the first phase.

## Enhancing Low Vision Services in Kerala

Kerala Society of Ophthalmic Surgeons (KSOS) reached out to Aravind Eye Hospital, seeking assistance to

*At the strategic planning workshop for enhancing low vision services in Kerala*



enhance low vision services in Kerala state. Through a series of discussions, it was decided to custom design a structured training and capacity building programme for Optometrists and participating eye hospitals from all districts in Kerala. As part of this, the first batch of six optometrists /ophthalmic assistants from three eye hospitals in the state participated in a month-long training at Aravind Eye Hospital, Madurai during April-May 2019. Subsequently, a strategic planning workshop for these hospitals was facilitated by LAICO from May 31-June 1, 2019.

## Replicating Aravind Vision Centre Model

The proven effectiveness of the Aravind model of primary eye care delivery through telemedicine enabled vision centres has captured the attention of several governments and eye care providers. Some expressed their interest in replicating this model in their settings. In response to this, LAICO provided technical support to the Govt. of Tamil Nadu for setting up 32 vision centres spread across all districts in the state.

LAICO received a request from Sitapur Eye Hospital, UP, to help improve the efficiency of its vision centres. Aravind conducted an online test to understand the clinical competency level of the technicians. The scores in discussion with the leadership team of Sitapur helped in designing an appropriate onsite training programme. A four-member team from Aravind made a visit to Sitapur during January 27-31, 2020 to get first-hand knowledge of their vision centre operations, issues and skills of technicians. The team conducted a vision building and strategic planning workshop for the staff. A detailed action plan was developed to enhance the efficiency of the vision centres. As a follow-up to this, vision centre core team from Sitapur Eye Hospital made a visit to Aravind-Madurai from February 24-29, 2020 to understand several aspects of vision centre management.

Aravind has been working with the Govt. of Bangladesh for the past few years in setting up vision centres across the country. In the second phase of this initiative, Aravind team helped National Institute of Ophthalmology to set up 30 vision centres around Rajshahi and Rangpur Medical Colleges in Bangladesh, taking the total to 50 vision centres. Staff from these centres were trained at Aravind-Madurai and Tirunelveli in multiple batches. This included skill assessment and certification. Apart from working with governments, LAICO also works with individual hospitals that have the potential and desire to run vision



*Aravind team visiting a vision centre run by Sitapur Eye Hospital, UP*

centres. Such requests came from two hospitals -Netaji Eye Hospital, Ramchandrapur and Rotary Hooghly Eye Hospital, both in West Bengal. The hospitals' plans and proposals were reviewed and finalised by the LAICO team. Subsequently, with Seva's funding support, LAICO facilitated the establishment of four vision centres (three for Netaji and one for Rotary).

### Capacity Building Project in Indonesia

Senior management team from PT Elang Medika Corpora, Indonesia visited LAICO during January 27-29, 2020 to get exposure to the Aravind model and to develop a business plan towards establishing a secondary eye hospital at Sentul, Indonesia. The team visited Andipatti vision centre and Aravind - Theni to get more insights and ideas for successfully running a secondary eye hospital.

### Support to Aravind Centres

As is customary for any of Aravind's new hospitals, LAICO organised a vision building workshop for the start-up team of Aravind Eye Hospital, Kovilpatti at Tirunelveli during September 24-25, 2019. The workshop deliberated on the service area population, expected patient load and outreach programmes and came up with detailed operational action plans.

### Benchmarking of Aravind Facilities

Aravind-Madurai, April 9-10

LAICO for years had been running benchmarking workshops for its mentee hospitals as a cross-learning platform. In this, the performance data are converted into comparable metrics so as to learn from the variations. This exercise was done for Aravind's network of hospitals for the first time. With guidance

from the Senior Management team of Aravind, LAICO organised this workshop to review the benchmarked performance of seven of the larger Aravind Eye Hospitals-Madurai, Tirunelveli, Theni, Coimbatore, Pondicherry, Salem and Chennai. Various metrics for the year 2018 were analysed - outpatient visits, surgery proportion, quality outcomes, specialty services, opticals delivery, staff productivity and punctuality. Over 30 senior staff including chief medical officers from across these centres participated. As this was found to be very useful and educative, this comparative benchmarking across hospitals is being integrated into the "parameter" meetings which is an in-depth performance review done in each hospital.

## Teaching and Training

### Onsite Training

#### Management Training Programme for Heads of Eye Hospitals/Departments

Upon request from Fred Hollows Foundation (FHF), China, a team consisting of Dr. Shivakumar Chandrashekar, Chief, Cataract & IOL services, Aravind-Tirunelveli and Mr. Sanil Joseph, Senior Faculty, LAICO conducted a training programme for leaders and management staff of FHF partner hospitals at Kunming, China from May 28- 30, 2019. Over 20 persons from 14 hospitals attended.

#### Follow up visit to Comprehensive Community Based Rehabilitation in Tanzania (CCBRT)

Dr. R. Sankarananthan, Medical Officer, Cataract Services, Aravind-Madurai made a second visit to CCBRT, Dar es Salaam, Tanzania from May 25- June 1, 2019, to train doctors in phacoemulsification

*Dr. R. Sankarananthan with Dr. Bedan, Dr. Cyprian and Ms. Anastazia at CCBRT, Dar es Salaam, Tanzania*





technique. During this visit, he also participated in the 7th Congress of the Ophthalmological Society of Eastern Central and Southern Africa (COECSA) held in Rwanda during August 21-23, 2019.

#### Eyexcel Bangladesh

Following the successful conduct of Eyexcel Global for over a decade at Madurai, the course is being offered annually in Nepal by Seva Nepal and in Latin America by Visualiza, Guatemala since 2016. For the first time, LAICO organised Eyexcel in Bangladesh exclusively for eye care training institutions in the country, with the support of Seva Foundation, USA and the International Council of Ophthalmology (ICO). The course was hosted by Ispahani Islamia Eye Institute Dhaka from November 11-21, 2019. Eight teams (25 participants) from seven Institutions attended. LAICO faculty, Ms. Dhivya Ramasamy and Mr. Sanil Joseph anchored the course along with Dr. Karl Golnik from ICO. Eyexcel alumni from Bangladesh also contributed as resource persons for teaching and facilitation of group discussions.

#### Leadership Development Programme: Academic and Research Committee - All India Ophthalmological Society (AIOS)

Gurugram, Haryana, February 12

LAICO organised the daylong session as part of the Leadership Development Programme of the Academic and Research Committee of AIOS. The programme was for a cohort of ophthalmologists wanting to improve their practice management and leadership skills. The session, held a day before the start of the annual conference of AIOS focused on patient centred care,



*Mr. Thulasiraj Ravilla at the ARC - AIOS 2020 Leadership Development Programme*

employee engagement, dealing with digital dilemmas as well as improving profitability. This is being done for the third time for the Academic and Research Committee of AIOS.

#### Aurosiksha

Aurosiksha focused on Allied Ophthalmic Personnel (AOP) now features a monthly quiz feature for all its subscribers. The monthly quiz focuses on a specific theme and invites learners to test themselves and offers additional learning resources for them to refresh their knowledge. Since December 2019, the monthly quizzes have been taken by over a thousand respondents. In terms of new resources, twelve new skill evaluation rubrics have been developed.

The Aurosiksha Learning Management System was implemented at Aravind Eye Hospitals Madurai and Pondicherry, for the Refraction and Opticals

*Dr. Shivakumar Chandrashekar and Mr. Sanil Joseph with participants of Management Training Programme for Heads of Eye Hospitals held at Kunming, China*





*Dr. Kedar Mate handling a training session for the staff*

department trainees. Through this system, the conduct of classes, attendance, skills practice and skills assessment using appropriate rubrics are all tracked. This system was also used to conduct online assessments for over 200 MLOPs at Aravind Eye Hospitals and 17 vision centre technicians of Sitapur Eye Hospital, UP.

A team from Tilganga Eye Hospital, Kathmandu, Nepal underwent an in-depth training in the development of online learning resources in December 2019.

## October Summit

### Enhancing Eye Care through Effective Mentoring

LAICO, September 27-29

This workshop was designed to learn from consulting companies and management institutions about the

consulting framework and best practices. It brought in like-minded institutions working in the field of health care, to share their best practices and the way they achieve the overall goal of helping client organisations improve. Participants got an opportunity to learn and adopt new ideas as well as think beyond their current practices and limitations. A total of 37 individuals from eye hospitals, consulting companies and management institutions participated.

### Developing an Effective Workforce: Allied Ophthalmic Personnel (AOP)

LAICO, September 30-October 1

Creating an effective AOP cadre poses two major sets of challenges relating to: (1) effective training and (2) getting the best out of AOP at work. This consultative workshop brought together organisations that face these issues and deliberate on ways to overcome these challenges and to share best practices and relevant resources. Around 40 people participated.

### Internal Capacity Building

Dr. Kedar Mate, Chief Innovation and Education Officer from Institute for Healthcare Improvement, Boston, USA came as a Fulbright scholar and spent over a month at LAICO during December 2019-January 2020 to coach the LAICO team on the art and science of bringing about improvement in a systematic manner. This has equipped the LAICO team to better run the LEAP collaborative series which is all about working intensely with participating hospitals, over a year to bring about improvements in the areas focused in each of the collaborative series.

*Participants at Eyexcel Bangladesh*





## Health Services Research

As part of expanding the research capacity building initiatives, Aravind team, upon request from Preethi Institute of Medical Sciences and Research, Madurai conducted Research Methodology workshops for DNB residents from various clinical specialities. LAICO's weekly journal club discussed 42 research publications with active participation from all Aravind centres. Eleven articles based on health services research (HSR) studies were published in indexed journals during the last year.

Following are the ongoing research projects under HSR:

1. Effectiveness of tele-ophthalmology in providing comprehensive primary eye care in rural southern India
2. Impact of electronic medical record implementation on patients and care providers in tertiary eye hospitals
3. Evaluation of effectiveness of the low-cost, portable, accurate autorefractor to provide well-tolerated eyeglass prescriptions
4. Validation of non-ophthalmologist graders in identifying diabetic retinopathy through tele-retinal imaging.
5. Comprehensive eye care work Assessment study in Theni district of Tamilnadu
6. Study on evaluating the effectiveness of mentoring process, from mentees perspective, in SCALE capacity building initiative
7. Enablers and barriers for accepting cataract surgery in secondary eye hospital settings
8. Perfecting refraction in India with superior service models: A cluster-randomised controlled trial of three models of school-based spectacle service delivery in India

## Projects

Listed below are the projects currently managed by LAICO

1. Diabetic Retinopathy Project at Aravind-Tirunelveli: funded by Queen Elizabeth Diamond Jubilee Trust through Public Health Foundation of India
2. RoP Project at Aravind-Tirunelveli: funded by Scope International through the Seeing is Believing initiative
3. Refractive Error among Children at Aravind-Madurai: funded by Orbis-India
4. Affordable treatment for low socio-economic patients with painful corneal ulcer at Aravind-Madurai: funded by Scope International through the Seeing is Believing initiative
5. Equipment support for better diagnosis of corneal ulcers at Aravind-Madurai: funded by Scope International through the Seeing is Believing initiative
6. Developing an affordable and contemporary corneal storage medium at Aravind-Madurai: funded by Scope International through the Seeing is Believing initiative
7. Eye Care for Tibetan refugees in India at Aravind-Coimbatore: funded by Seva Foundation
8. Innovative approach to strengthening comprehensive eye examination in outreach activities including the use of EMR at Aravind-Pondicherry: funded by Scope International through the Seeing is Believing initiative
9. Retinopathy of prematurity project at Aravind-Theni: funded by FDC Limited, Mumbai
10. Vision centre projects (Cycle 7): funded by TOMS through Seva Foundation
11. Vision centre projects (Cycle 9) for 3 VCs: funded by TOMS Seva Foundation
12. Dr. V's birth centenary commitment towards setting up of 10 vision centres: funded by Seva Foundation
13. Providing optimal care for economically disadvantaged people with ocular trauma at Aravind-Madurai: funded by Standard Chartered Global Business Services (GBS) Pvt Ltd

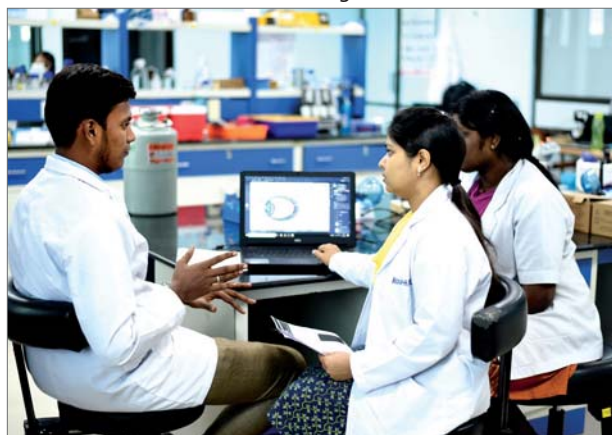
# Research

*The latest gene augmentation therapy for a minor sub-group of retinitis pigmentosa is a sensational first ever direct gene delivery-based treatment for any human disease. Basic concepts known for years have been validated and shown to be effective in gene-based one-time treatment of a disorder. This progress demonstrates the fruitful collaboration of clinicians and basic scientists and highlights the essential role of industrial partnership. Bench to clinic to personal medicine is no longer a dream and one-time gene augmentation therapy comes of age with the approval of the gene therapy for retinitis pigmentosa by the regulatory agencies. Sustained support for basic research and intense collaboration between basic and clinician scientists will yield significant benefits to the patients as has been advocated by Aravind Eye Care system since inception.*

## Molecular Genetics

The research group focuses on unveiling the ocular genetics and other allied mechanisms of many inherited disorders including macular corneal dystrophy (MCD), Leber's hereditary optic neuropathy (LHON; mitochondrial disorder), retinal dystrophies (RDs) such as Stargardt, Best disease, Usher syndrome (USH), Bardet-Biedl syndrome (BBS), Leber's congenital amaurosis (LCA) and Juvenile X-linked retinoschisis (JXL). Research is going on to understand the corneal microstructural changes and associated immunophenotypes of Indian MCD patients due to corresponding candidate CHST6 gene mutations. In addition, the team employed next-generation sequencing (NGS) approaches in patients with Best disease, USH, BBS and Stargardt disease to reveal the underlying causative genes for clinical diagnosis which will aid in genetic counselling for family members.

*Research scholars at the Molecular genetics lab*



Furthermore, the department also uses an integrated approach with clinical, genetic and computational analyses for other paediatric eye diseases such as LCA, JXL and LHON to underpin the underlying molecular cause. Characterising the candidate genes of these disorders, their mutation spectrum and establishing the genotype-phenotype correlations will be useful to comprehend the disease prognosis and further gain insights into pathogenesis and progression.

Genetic studies of ocular cancers are carried out to investigate the major challenges of cancer such as chemoresistance, tumour progression and recurrence. Cancer stem cells denoted by specific markers are found to be responsible for the chemoresistance in retinoblastoma through the analysis of the cellular models and tumours that are resistant to current treatment. In order to design newer therapies, deletions and duplications are checked and frequent alterations are found in some genes. In addition to the genetic changes, epigenetic changes that regulate the gene expression have been identified. With these multiple approaches, genes related to cell division and apoptosis are found to be responsible.

## Ocular Pharmacology

Steroid-induced ocular hypertension/glaucoma is a serious side-effect associated with the chronic use of steroids. However, the molecular mechanism is not well understood.

To understand the pathogenesis of steroid-induced ocular hypertension/glaucoma, some unique genes and microRNAs (small non-coding RNAs) were identified





Ocular pharmacology lab

in the affected tissue cells (steroid-responsive and non-responsive human trabecular meshwork cells). Studies are underway to validate these microRNAs, their target genes and further their important signalling pathways. After validation, the potential miRNA(s) will be identified and evaluated for its efficacy in GC-OHT using HOCAS model.

## Bioinformatics

Bioinformatics lab primarily focuses on methods of NGSomics data analysis and the role of small noncoding RNAs as biomarkers for vision biology and eye diseases. The NGSomics includes whole genome, exome, transcriptome next-generation sequencing data analysis in identifying molecular targets for ocular cancer and eye diseases. The lab developed an in-house automated pipeline for whole exome/genome data analysis. Further, specific filtering and prioritization method was developed to identify disease-causing mutations from patients with genetic eye disorders. The machine learning models were successful in identifying

Bioinformatics lab



mutations in Leber congenital amaurosis, X-linked retinoschisis, and Stargardt's disease. Interestingly, the method identified a novel variant in BEST1 gene X-linked retinoschisis. Also, the lab developed a best-performing transcriptome data analysis pipeline that would best perform on eye disease and ocular cancer data sets.

In tandem, the lab discovered new molecular diagnostic markers for intra-ocular tuberculosis from aqueous humour of the patients. A set of human small noncoding RNAs called miRNAs was discovered, and further functional studies are required to understand their role in IOTB, and as diagnostic markers.

## Proteomics

Biological processes at the molecular level could be studied using different approaches. Studies at the department primarily focus on proteins, which are the ultimate drivers of any biological process. The team uses proteomic analysis to study fungal keratitis, a common eye disease particularly in tropical countries like India. Management of fungal keratitis relies on the use of antifungal agents; however, understanding the role of host response to infection is essential for effective intervention. Confocal microscopy and proteomics studies demonstrated that corneal epithelial cells are capable of phagocytosis of fungal spores. Complementing the proteomics analysis, transcriptome profiling using high throughput NanoString analysis was also done. These data together revealed that epithelial layer, which is the outermost layer of the cornea, is an immune barrier in addition to being a physical barrier. The innate immune response to the fungal infection is usually through the recruitment of neutrophils. A comparative study on two different *Aspergillus* pathogens, *A. flavus* and *A. fumigatus* revealed that the neutrophil response is dependent on the pathogen and also, on the growth morphotype. Further, understanding of the host response to fungal infection was possible by studying the protein changes in the tear fluid from fungal keratitis patients. A large number of tear proteins were found to be altered during fungal infection and were considered as candidate biomarkers. These markers are currently being validated in a larger fungal keratitis patient cohort to identify those proteins that can help in predicting whether the patients will respond to treatment or not. Additional studies are in progress to elucidate the use of specific host proteins, induced by infection, for identification of the infecting pathogen.

Studies on diabetic retinopathy focus on identifying biomarkers that can predict the onset and progression of diabetic retinopathy in type II diabetes patients. Discovery phase studies in search of candidate protein biomarkers have been carried out using serum, serum microparticles (small vesicles present in serum that are secreted by various cell types) and vitreous humour. In parallel, validation of selected 12 serum markers in a large cohort of patients from Indian and UK population is currently in progress as part of the Indo-UK collaborative study. These studies will ultimately result in the development of a simple, sensitive and reproducible assay to monitor diabetic retinopathy. Another area of focus in diabetic retinopathy study is the identification of differentially expressed serum microRNAs involved in the progression of the disease. A few differentially expressed microRNAs like miR 320a, miR 27b, miR 181a and miR 451a and their targets have been identified and validated in serum samples, which hold the promise of being characterised as biomarkers for the progression of the disease.

A comprehensive histopathological and proteomics approach was employed to understand the role of iris in the pathogenesis of pseudoexfoliation (PXF) glaucoma. Proteome analysis of the iris tissue from unaffected, unilateral PXF and bilateral PXF donors revealed changes in iris proteins specific to the different stages of pseudoexfoliation syndrome. These results are currently validated in additional iris samples from donors' eyes as well as from PXF patients undergoing iridectomy. These studies will help decipher the involvement of iris in PXF syndrome as well as identify prognostic markers for monitoring the PXF progression. A novel chemical cross-linker for the treatment of keratoconus has been developed through a collaborative

project involving AMRF, Aurolab and the University of Liverpool. The chemical cross-linker has shown promising results both in ex-vivo pig eyes and human eyes in terms of increasing the stiffness of the cornea with negligible cytotoxicity to the cells of corneal layers. This chemical cross-linker is currently being evaluated as an alternative to conventional UV-A cross-linking treatment. From the previous study, a new project has been sanctioned by the Indian Council of Medical Research to investigate the molecular mechanism of action of the cross-linker in human corneas.

## Stem Cell Biology

The thrust of research at the department is to understand the basic biology of adult tissue resident stem cells in the human eye, their role in the normal maintenance of the tissue and changes in ocular disease/disorder.

Extensive studies on the limbal epithelial stem cells led to the establishment of a specific method for their identification, quantification, enrichment and molecular characterisation. Recently, two miRNAs (long non-coding RNAs) specific to limbal epithelial stem cells were functionally proven to suppress the proliferation/differentiation associated gene targets, thereby increasing the stem cell content in limbal epithelial cell cultures.

Studies on developing a cell-based therapy for glaucoma have also been initiated. Immunostaining for stem cell markers confirmed the presence of stem cells in the Schwalbe's line region of the trabecular meshwork (TM). An age-related reduction in trabecular meshwork stem cell content was demonstrated to be significantly associated with the total TM cell loss. Further quantification of stem cells in the TM tissues from known glaucomatous donors revealed a higher reduction compared to age-matched controls which might be associated with the drastic reduction the total TM cellularity, thus altering the tissue maintenance leading to the increase in intraocular pressure. Having demonstrated that the adult stem cells in glaucoma are reduced, the current focus is to evaluate whether a stem cell based therapy will enable TM regeneration to restore the normal IOP.

Basic biology on human lens epithelium from excised globes from Rotary Aravind International Eye Bank identified the central zone to contain stem cells. Similar studies are being carried out to locate the stem cells in human retinal pigment epithelium.

### *Stem cell biology research*





## Ocular Microbiology

The major research focus of the department is on ocular pathogen epidemiology, as well as to understand the pathogenesis and antibiotic resistance mechanisms at the molecular level. Ocular tuberculosis is one of the poorly understood eye diseases and is highly challenging for diagnosis. Currently, profiling of the microRNA in ocular fluids of the ocular tuberculosis patients is in progress for identifying unique microRNAs, which can be explored as diagnostic markers. Another study is in progress for the understanding of virulence factors of the bacterial pathogen *Pseudomonas aeruginosa* causing contact lens associated keratitis. Advanced high throughput Next Generation Sequencing (NGS) methods are being explored for its application in diagnosis, as well as understanding the pathogens at the genome level. The department completed a multi-centre Asia Cornea Society of Infectious Keratitis Study involving national and international eye institutes from the Asian continent. By employing Multi Locus Sequence Analysis (MLSA) and genotyping, previously unreported species belonging to the genus *Acanthamoeba* and *Nocardia* was identified in causing ocular infections.

## Major Events

### Science in Everyday Life

September 28

As part of October Summit 2019, Aravind Medical Research Foundation (AMRF) organised the one-day exhibition in collaboration with colleges and universities in and around Madurai. Elaborate models on scientific principles explaining various physiological

*At the exhibition on Science in everyday life*



*Workshop on Advances in Clinical Genomics*

processes in humans were kept on display. Around 140 students visited the exhibition.

### Advances in Clinical Genomics: Hands-on-workshop on Next Generation Sequencing (NGS)

January 23-25

As part of DBT Centre of Excellence programme, *Translational genomics of paediatric eye diseases*, AMRF organised this three-day workshop. Over 10 participants including faculty and research scholars from colleges and other institutions took part.

## Awards/Fellowships

### Indian National Science Academy (INSA) - Israel Academy of Sciences Bilateral Exchange Programme

November 4-17

Dr. P.Sundaresan, Senior Scientist, AMRF was awarded visiting fellowship by INSA and the Israel Academy





*Dr. P. Sundaresan during his visit to Hadassah-Hebrew University Medical Center, Jerusalem, Israel*



*Ms. K. Lavanya - Recipient, Commonwealth Split-site Scholarship*

of Sciences under the International Collaboration/ Exchange programme 2019. As part of this, he visited the Department of Ophthalmology, Hadassah-Hebrew University Medical Center, Jerusalem, Israel. The main purpose of the visit was to work on molecular genetics of inherited retinal dystrophies and explore bioinformatics analysis of next generation sequencing.

### Commonwealth Split-site Scholarship

Ms. K. Lavanya, Senior Research Fellow, Department of Immunology and Stem cell Biology received

Commonwealth Split-site Scholarship awarded by Commonwealth Scholarship Commissions UK and pursued, a part of her doctoral research with Prof. Julie T Daniels at Institute of Ophthalmology, University College London (UCL-IOO), United Kingdom from January to December 2019.

She carried out studies to understand the molecular regulatory potential of corneal epithelial stem cells specific miRNAs in the maintenance of stemness in the limbal epithelial cells using 3D RAFT culture system.

### Ph.D awarded by Madurai Kamaraj University for the studies carried out at AMRF



Mr. Mohd Hussain Shah  
Molecular Genetics  
Thesis: Genetics and functional approaches to understand the pathogenicity of primary open angle glaucoma  
Guide: Dr. P. Sundaresan



G. Prakadeeswari  
Molecular Genetics  
Thesis: Molecular analysis of various risk factors involved in pseudoexfoliation syndrome  
Guide: Dr. P. Sundaresan



M.K. Jhansi Rani  
Immunology and Stem Cell Biology  
Thesis: Molecular signature of human limbal epithelial stem cells  
Guide: Dr. Gowri Priya Chidambaranathan



## Ongoing Projects

### Basic Research

- Pathogenic *Aspergillus*: Interaction with innate immune cells (Indo-French Collaborative project)
- Study on Human mycotic keratitis
- A prospective, multicentre discovery and validation of diagnostic, circulating and urinary biomarkers and development of sensor(s) to detect sight-threatening diabetic retinopathy - Biomarker and Biosensor study in UK and India
- Proteome profiling of serum microparticles in diabetes and diabetic retinopathy patients: Towards identification and validation of predictive biomarkers
- Functional analysis of circulating microRNAs and their regulatory role in diabetic retinopathy
- Molecular genetics of macular corneal dystrophy in Indian population
- Genetics of retinal dystrophies
- Genetic and transcript analysis of *RBI* gene in south Indian retinoblastoma patients
- Understanding the molecular mechanisms of chemoresistance in retinoblastoma
- Molecular characterisation of tumour progression in retinoblastoma
- Identification and validation of deregulated cancer pathways in retinoblastoma
- Translational genomics of ocular cancers
- COE LEAD: Translational genomics of paediatric eye diseases
- COE PR-I: Molecular analysis of mitochondrial diseases with ophthalmic manifestations
- COE PR-II: Epigenetic mechanisms underlying tumour progression in retinoblastoma
- COE PR-III: Functional validation of novel candidate genes using alternate model
- COE R&D: Computational methods for whole exome/genome sequencing of paediatric eye diseases
- Limbal miRNAs and their potential targets associated with the maintenance of stemness
- Characterisation and functional evaluation of trabecular meshwork stem cells in glaucoma pathogenesis
- Characterisation of adult human lens epithelial stem cells in the maintenance of tissue homeostasis throughout life and their functional status in cataractous lens
- Prediction of treatment outcome in fungal keratitis patients
- Role of miRNA in the regulation of glucocorticoid receptor (GR) signalling and development of new therapeutics for steroid-induced glaucoma
- Diagnostic markers for ocular tuberculosis
- Computational methods for whole exome/genome sequencing of paediatric eye diseases
- Comparative genomics of methicillin-resistant *Staphylococcus aureus* (MRSA) and *Pseudomonas aeruginosa* ocular isolates from keratitis patients with different clinical outcomes
- An in-silico approach for identification of aberrant metabolic pathways in retinal angiogenesis towards early diagnosis and development of personalised medicine
- Genotyping and phylogenetic analysis of *Pythium insidiosum* causing human corneal ulcer
- Identification and evaluation of genetic relationship based on multilocus sequence analysis in *Nocardia* sp causing human ocular infection
- Genotyping and phylogenetic analysis of *Acanthamoeba* sp using the 18S ribosomal DNA region (JDP 1/2) from *Acanthamoeba* keratitis patients

### Clinical Research

#### Glaucoma

- Screening the Kadaladi family with early onset glaucoma for Myocilin gene mutations and development of ER stress reversing novel chemical entities as topical ophthalmic formulations
- Safety and efficacy of subconjunctival injection bevacizumab versus injection mitomycin-C in Trabeculectomy - A one-year prospective randomised controlled study
- Assessment of tear film alterations in patients using topical anti-glaucoma medications
- Enhancing early glaucoma detection through family screening to reduce glaucoma related blindness.
- A prospective cohort study of corneal endothelial cell loss after Aurolab Aqueous Drainage Implant (AADI) implantation
- The effect of learning curve on the surgical outcomes of combined cataract extraction and Trabeculectomy surgery
- Improving adherence to follow-up in childhood glaucoma
- Indian childhood glaucoma incidence study
- Difference of uveal parameters between the acute primary angle closure eyes and the fellow eyes in south Indian population
- Deep learning algorithms applied to optical coherence tomography images of the optic nerve head for improved glaucoma diagnosis
- Shared medical appointments randomised trial
- The Asia primary tube versus trab (TVT) study
- Efficacy of intracameral moxifloxacin in blebitis/endophthalmitis prophylaxis for trabeculectomy at Aravind Eye Hospitals
- Intraocular pressure dynamics after Water drinking test and Diurnal variation test in glaucoma suspects.
- Non interventional cohort study: Mean rate of progression in visual fields of patients with primary open angle glaucoma and ocular hypertension attending a tertiary eye care centre in south India.
- BLEB needling study: Bleb needling for failure of filtration surgeries with mitomycin C in primary glaucoma in South Indian Population.
- AADI-250: To evaluate the efficacy and safety of Aurolab Aqueous Drainage Implant (AADI) on intraocular pressure reduction in paediatric patients with refractory glaucoma.
- DALK study: Incidence of elevated intraocular pressure following deep anterior lamellar keratoplasty: a prospective observational cohort study

- Mannitol study: Comparison of intraocular pressure reduction with intravenous mannitol in vitrectomised and non-vitrectomized eyes

#### Paediatric Ophthalmology and Adult Strabismus

- Long term outcomes of ectopia lentis managed with Cionni CTR placement in paediatric patients
- Heritability and clinical profile of myopia in children in a tertiary care hospital: A cross sectional study
- Ocular biometry and retinal nerve fibre layer and macular thickness in a paediatric myopic patients treated with 0.01% Atropine.
- Etiology of paediatric cataract
- Yoke prism trial
- Impact of digital resources in quality of life in visually impaired - before and after NVDA usage
- Prevalence of colour blindness
- LCA-Clinical profile and genetics part
- Intermittent Bworn's - A case of circadian heterotropia
- Effect of subtenon anaesthesia in addition to general anaesthesia in paediatric strabismus surgery
- BYNOCS - Anti suppression utility
- Patan's syndrome
- Case report- Pseudo brown and rare presentation of ocular cysticercosis
- Inferior rectus recession in B/L SO Palsy on primary procedure
- Hypomyelination of basal ganglia, cerebellum
- Case series - Muscle transplantation in TRO
- Acquired inverse DRS
- Comparison of motion stereopsis and static stereopsis in patients with intermittent exotropia
- Case series - Late onset esotropia

#### Cornea

- Correlation between handedness and ocular dominance in strabismic amblyopia
- Knowledge and awareness regarding eye donation- A survey
- To evaluate the outcome of topical UV lube in dry eye patients due to secondary Sjogren syndrome
- Comparison of i-TRACE aberrometry outcomes in customised PRK, customised LASIK and Femto LASIK for moderate to high myopia
- To evaluate the outcome of topical chloroquine phosphate in dry eye patients due to primary and secondary Sjogren syndrome
- CLAIR I (Cross-linking Assisted Infection Reduction)
- CLAIR II
- Parasitic Ulcer Pilot Study (PUPILS)
- A Prospective observational study of the Socioeconomic, demographic profile health-seeking behaviour, cost implications, clinical features and visual outcomes following penetrating ocular trauma.

#### Cataract and IOL

- A prospective, multi-centric, randomised controlled, study on long term outcomes of phacoemulsification with intraocular lens implantation in pseudo exfoliation syndrome patients.
- A prospective, non-randomised, single arm, open label study to evaluate the efficacy of multifocal intraocular lenses with patients having cataract in both eyes.
- Visual performance comparison between phacoemulsification and manual small incision cataract surgery in eyes with senile cataract - A prospective randomised clinical trial
- Complications and visual outcomes in miniCAP and phacoemulsification cataract surgeries performed by trainee ophthalmologists - A multi-centre randomised controlled trial
- Prostaglandin level estimation in phacoemulsification and femtosecond laser-assisted cataract surgery with and without NSAID and correlation with postoperative inflammation and cystoid macular edema
- To compare the stability of Iris fixated IOL between 3 piece PMMA and single piece IOL with modified haptic's
- Surgical outcome comparison of miniCAP Vs phacoemulsification - A randomised controlled trial
- Visual outcomes and clinical profile in patients with traumatic cataract from blunt injury: A prospective study
- Comparison of refractive outcome after limbal relaxing incision during phacoemulsification and Arcuate keratotomy during femtosecond laser cataract surgery to correct astigmatism.

#### Neuro-Ophthalmology

- A phase 2/3, randomised, double-masked, sham-controlled trial of QPI- 1007 delivered by single or multi-dose intravitreal injection(s) to subjects with acute nonarteritic anterior ischemic optic neuropathy (NAION)

#### Retina and Vitreous

- SiB Scope retinopathy of prematurity-project
- RAINBOW extension study: an extension study to evaluate the long term efficacy and safety of ranibizumab compared with laser therapy for the treatment of infants born prematurely with retinopathy of prematurity.
- Correlation of pre-operative OCT of macular hole and post-operative outcome
- Comparison of accuracy in the interpretation of OCT findings by trained technicians Vs retina specialist
- Can ultra-wide field imaging by OPTOS or CLAR-US replace clinical examination in detecting horseshoe tears requiring barrage laser? A comparative analysis at a tertiary eye care centre.
- A comparative account of ultra-wide field imaging by Optos and Clarus in non-mydriatic eyes using a pupillometer
- Role of 3-D vitrectomy surgery as a teaching tool in training postgraduates and trainees in retina.
- Role of ultra-wide field retinal imaging as a preoperative tool in identifying the breaks in rhegmatogenous retinal detachment
- Evaluation of macular perfusion, foveal avascular zone and



- photoreceptor integrity in diabetic macular edema patients after Anti-VEGF treatment
  - To investigate the safety and efficacy of polyglactin - 910 sutures in ophthalmic surgical procedures
  - Relationship between the morphology of diabetic macular edema and nephropathy in south Indian population
  - Comparison of macular pigment optical density status after macular hole surgery between digitally assisted vitreoretinal system and conventional analog microscope
  - Changes in subfoveal choroidal thickness in proliferative diabetic retinopathy eyes undergoing panretinal photocoagulation using green laser versus yellow laser - An enhanced depth imaging optical coherence tomography (EDI OCT) measured comparative study
  - Long-term effects of semaglutide on diabetic retinopathy in subjects with Type 2 diabetes (FOCUS)
  - CAD - VC Study: Reader study of Arda assisting Aravind Tele-ophthalmologists and Vision Centers
  - SMART - ORNATE India Project (Statistical modelling and risk assessment of Type 2 diabetes complications in India)
  - A multi-centre, randomised, double-masked, active-controlled, comparative clinical study to evaluate the efficacy and safety of MYL-1701P and Eylea® in subjects with diabetic macular edema
  - A randomised, phase 3, double-masked, parallel-group, multicenter study to compare efficacy and safety of QI205 versus Lucentis® in subjects with neovascular age-related macular degeneration
  - RAINBOW extension study: an extension study to evaluate the long term efficacy and safety of ranibizumab compared with laser therapy for the treatment of infants born prematurely with retinopathy of prematurity
  - Validation of neuropupillary index (NPI) measured by automated Neuroptics PLR-3000 pupillometer in diagnosing ocular pathologies in south Indian population
  - GOAP, Scope – RoP Tele screening
  - EYLEA Study: Structured Post-marketing surveillance to collect the safety data of intravitreal aflibercept injection (IVT-AFL) in patients of wet age-related macular degeneration during real-world clinical practice.
  - Conventional versus inverted flap technique for large macular holes: A prospective randomised control trial
  - Subjective high-risk patient counselling randomisation project
  - A study on the differential expression of Piwi-interacting RNAs (piRNA) and altered Piwi-like protein interactions in diabetic retinopathy
  - Comparison of staging of diabetic retinopathy by an offline artificial intelligence with onsite doctor examination and fundus grading by a retina specialist
  - A phase III randomised, double-masked, parallel group, multicentre study to compare the efficacy, safety, pharmacokinetics and immunogenicity between SB11 (proposed ranibizumab biosimilar) and Lucentis in subjects with neovascular age-related macular degeneration
  - A two-arm, randomised, double-masked, multicenter, Phase III study assessing the efficacy and safety of brodalumab versus aflibercept in adult patients with visual impairment due to diabetic macular edema
  - Translating research into clinical and community practice: a multi-state, multi-centre statistical modelling of risk-based stratified and personalised screening for complications of diabetes in India.
- ### Uvea
- Efficacy and safety of posterior subtenon's triamcinolone acetate, intravitreal triamcinolone acetate, intravitreal bevacizumab, intravitreal Ozurdex for treatment of uveitic cystoid macula edema
  - Macular edema nepafenac vs difluprednate (MEND) Uveitis Trial
- ### Health Services Research
- Effectiveness of teleophthalmology in providing comprehensive primary eye care in rural southern India
  - Impact of electronic medical record implementation on patients and care providers in tertiary eye hospitals
  - Evaluation of the effectiveness of low-cost, portable, accurate autorefractor to provide well-tolerated eyeglass prescriptions
  - Validation of non-ophthalmologist graders in identifying diabetic retinopathy through tele-retinal imaging.
  - Comprehensive eye care work Assessment study in Theni district of Tamilnadu
  - Study on evaluating the effectiveness of mentoring process, from mentees perspective, in SCALE capacity building initiative
  - Enablers and barriers for accepting cataract surgery in secondary eye hospital settings
  - Perfecting refraction in India with superior service models: A cluster-randomised controlled trial of three models of school-based spectacle service delivery in India
  - A randomised controlled trial to assess the follow-up adherence of patients identified with posterior segment diseases in outreach camp. Fundus imaging randomised subjective trial.
- ### Clinical Trials - Aurolab
- A prospective, non-randomised, single arm, open label study to evaluate the performance of multifocal intraocular lenses (MFIOL) with patients having cataract in both eyes
  - To study the safety and performance of high refractive index cast molded hydrophobic intraocular lenses with age-related cataract patients.
  - A prospective, non-randomised, single-arm clinical trial to investigate the safety and efficacy of nylon sutures in small incision cataract surgery.

# Ophthalmic Supplies and Equipment

*Staying true to its mission, Aurolab continues to manufacture ophthalmic consumables, ensuring affordability and quality. Necessary modifications were made in the existing products to accommodate the users' needs. Aurolab's coated polymeric cartridges for delivery of intraocular lens was granted a patent by the Govt. of India in August 2019. International Marketing division expanded its network to include a few more of the developed nations.*

*For the first time, Aurolab organised a consultation as part of the October Summit. Conducted in a think tank mode, the consultation titled, 'Companies as market drivers' had Aurolab's peer groups collectively exploring their role in driving the market to address eye care issues globally. Representatives from Essilor India Private Ltd, Appasamy Associates, Remidio, Forus Health, Vision Spring, LV Prasad Eye Institute, ISCON Surgicals, Google, and International Agency for Prevention of Blindness participated.*

## Focus on the Need of the Hour

With the outbreak of COVID-19 pandemic, Aurolab shifted its focus in response to the need of the hour. The focus was turned towards preparing Personal Protective Equipment (PPE) for health care workers. Production of hand sanitisers was stepped up to meet the increasing demand. Aurolab designed and produced a protective shield to be placed on the slit lamp, and a face shield for doctors to wear during other procedures, to prevent the spread of infection while examining patients. These face shields will go a long way benefitting a wider community beyond eye care workers.

Aurolab also focused on improvising the PPEs with advanced safety features for ensuring better protection. Face shields are manufactured from Amorphous-polyethylene terephthalate (APET) to provide better transparency. The width of the headband is increased from 6mm to 12mm to ensure durability to the shield. To avoid scratches on the shield, a peelable anti-scratch layer is coated inside, which can be removed at the time of use. For greater safety against the transmission of the droplets, Aurolab has also designed a reusable and flexible slit lamp breath shield

and chin rest shield made of acrylic material. It was also involved in drafting precautionary measures for COVID-19 and guidelines for the use of PPEs.

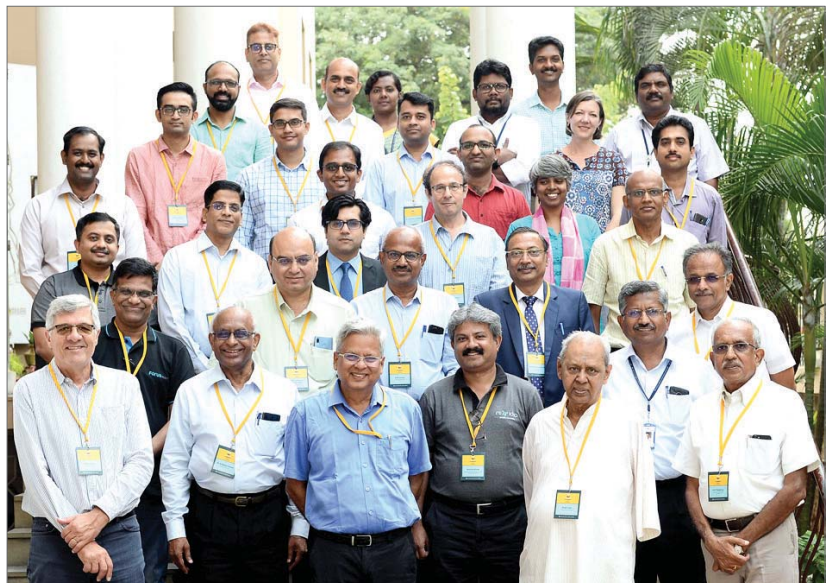
## Product Development

### New Products

Intraocular lens (IOL) division launched the following unique products:

- Aurovue EV Toric: These preloaded hydrophobic acrylic aspheric toric IOLs are intended for correction of astigmatism and spherical aberration.

*Participants of the Companies as market drivers consultation*





## New Products



*Aurovue Ev Toric*



*Aurovue Multipiece*



*Auro-CMC*



*Hylube*

- Aurovue Multipiece: Preloaded hydrophobic acrylic multipiece IOLs intended for scleral fixation, sulcus placement and other complicated cataract cases.

Pharmaceutical division launched two niche products named Auro-CMC (Carboxy Methyl Cellulose Sodium 0.5%w/v eye drops) and Hylube (Sodium hyaluronate 0.1%w/v eye drops), both used in the treatment of dry eye.

## Product Enhancements

Glaucoma drug preservative was changed from Benzalkonium Chloride (BAK) to Stabilized Oxychloro Complex (SOC). SOC preservatives are better tolerated than BAK. They do not cause any irritation and hence, are ideal for ophthalmic products used chronically or with a compromised ocular surface.

Modifications were brought in the packaging of products to ensure safety and longer shelf life.

Blades Division manufactured CE certified nanocut blades from high-grade stainless steel, using superior manufacturing technology. With anti-glare surface and autoclavable polycarbonate handles and cradle, nanocut blades ensure smooth incisions without resistance, thus enhancing superior wound reconstruction. The division has also made dual bevel profile in Aurosleek brand to ensure consistent sharpness. It provides good control and stability, penetrates easily and creates accurate width for optimum fit to different types of phaco tips

without wound leakage. This also helps avoid surgically induced astigmatism.

Equipment Division developed a high-resolution camera named Third-i, compatible with Hawk-i slit lamps to capture images and record videos while screening the patient. Hawk-i slit lamp was upgraded as a two-step model to provide greater space efficiency.

Hummingbird Phacoemulsification machine is enriched with audio output and more features.

Aurolase 532 Laser machine is upgraded with LCD touch panel for easy operation and integrated with Laser Indirect Ophthalmoscopy (LIO) delivery system.

In collaboration with Aravind Eye Hospital, Madurai and with support from Global Business Services – Standard Chartered Bank, Aurolab is developing an affordable and effective storage medium for preserving corneas. The project was initiated to improve the effectiveness of antibiotic supplementation of Cornisol (Corneal storage medium) by modernising the antibiotic selection and choosing Moxifloxacin, a fourth-generation fluoroquinolone, over Gentamycin and Streptomycin.

## Initiatives to Impact Primary Eye Care Delivery

Aurolab's portable autorefractometer (e-see) has been receiving an immense response from the ophthalmic community, mainly for its ease of use. Governments of

## Product Enhancements



*High grade stainless steel, autoclavable blades with antiglare surface*



*Hawk-i slit lamp attached with Third-i camera*



*Two-step model Hawk-i slit lamp*



*Laser machine with LCD touch panel and integrated LIO delivery system*



*e-see autorefractometer being used in Tele V-Care Centre*

Andhra Pradesh and Tamil Nadu use it to initiate mass free eye screening programmes in remote areas. A total of 130 e-see devices were supplied to the Government of Andhra Pradesh at an affordable rate. Under the Dr. YSR Kanti Velugu Programme, e-see will be used extensively in 13 districts of the state towards ensuring comprehensive and sustainable eye care to all.

Aurolab has supplied 32 devices to the Government of Tamil Nadu for setting up Tele-Vision Care units in its Primary Health Centres. This initiative is expected to significantly revolutionise the way eye care is being delivered especially in the rural parts of Tamil Nadu.

Aurolab has started offering one-stop solution for hospitals planning to set up primary eye care centres. Beyond delivery of equipment and service support, Aurolab in collaboration with LAICO provides orientation on setting up and successfully running vision centres as well as trains staff in teleconsultation.

It also provides Vision Centre Management Software (VCMS) as part of the package.

## Regulatory Activities

Uganda being a critical market for penetration and promotion of medical devices, Aurolab has taken steps to enter the market through the successful NDA Audit happened in June 2019.

Aurolab underwent audits by Supreme Board of Drug and Chemical Appliances, Yemen; Pharmacy and Poisons Board (PPB), Kenya; Food and Drug Administration (FDA), Thailand to ensure compliance with the highest standards of safety, efficacy and quality for all drugs, chemical substances and medical devices.

## Marketing

As part of October Summit, Aurolab organised a consultation titled Companies as Market Drivers on October 2, 2019.

To enhance surgical skills of doctors in phaco surgery, Aurolab established three training centres, one each at Priyamvada Birla Aravind Eye Hospital, West Bengal, Sri Ganapathy Nethralaya, Maharashtra and Sitapur Eye Hospital, Uttar Pradesh. This activity is being funded by Global Business Services – Standard Chartered Bank and three more centres will be established in the coming years.

Aurolab arranged a roundtable meeting for the users of multifocal intraocular lenses to update them on technological advancements in the field as well to reinforce the benefits of these lenses. Dr. Arulmozhi Varman of Uma Eye Clinic, Chennai and Dr. MS. Raveendra of Karthick Netralaya, Bangalore shared valuable inputs.

*Shri. Suresh Kumar Khanna, Hon'ble Cabinet Minister for Finance, Parliamentary Affairs and Medical Education, Govt. of UP attending a session during his visit to Aurolab*







*Mr. N. Vishnu Prasad with His Excellency, the President of India, Shri. Ram Nath Kovind and other participants at the 4th ASEAN-India Business Summit*

Aurolab conducted wetlab sessions for post-graduates to train them in the photocoagulation procedure using Aurolase 532 green laser machine and glaucoma shunt surgical technique using Aurolab Aqueous Drainage Implant. A training session using Hummingbird phaco machine was arranged at the surgical skills transfer courses conducted by Aravind Eye Hospital, Pondicherry and Kerala State Ophthalmic Conference held in November 2019.

The International Marketing Group (IMG) at Aurolab expanded the current distribution network to include developed nations such as Australia and France in addition to creating accessibility to customers in Ethiopia, Namibia, Jordan and Turkey through newly appointed dealership networks.

Aurolab launched its premium hydrophobic multifocal intraocular lens in the markets of Argentina, Colombia, Guatemala, Kenya and South Korea with

an objective to get into the premium segments of these markets.

Aurolab is one the very first Indian companies to complete registration of a wide range of eye drops in Nepal resulting in a supply of over 200,000 units of pharmaceutical products. Some of the other markets in which registrations were completed are Sudan and Iran. It is one of the very few Indian companies having passed the ANVISA audit from Brazil.

Aurolab took initiatives to expand its participation in trade shows globally. Mr. Vishnu Prasad, Marketing Manager-Exports represented Aurolab at the Philippines-India Business Conclave and the 4th ASEAN-India Business Summit held from October 17-21, 2019 at Manila, Philippines. He spoke on ways to address non-availability of affordable and accessible ophthalmic consumables in developing economies in the presence of His Excellency the President of India, Shri. Ram Nath Kovind.

*Aurolab stall at the 44th Perdami Exhibition, Makassar, South Sulawesi, Indonesia*



*Functional display of the Third-i camera at the 9th Conjoint Ophthalmology Scientific Conference conducted by Academy of Medicine, Malaysia*



# Recognitions and Achievements

## RECOGNITIONS

### Recognition to Aravind's contribution

London, UK, October 29

Aravind Eye Hospitals have been involved in training doctors, nurses and staff from the Commonwealth as part of a five-year programme funded by the Queen Elizabeth Diamond Jubilee Trust (QEDJT). In what can be termed as a clear recognition for Aravind for having taken up almost 40% of the training work, Dr. N. Venkatesh Prajna, Director-Academics was invited to a grand reception by Her Majesty Queen Elizabeth II in the Buckingham Palace, London. A group of 40 people from 32 countries, who have played different important roles in the QEDJT programmes, top ophthalmologists, ambassadors and secretaries from the Commonwealth, were in attendance.

### Pune Netra Seva National Award

Pune, December 29

Dr. P. Namperumalsamy, Chairman Emeritus, Aravind Eye Care System (AECS) received the award conferred on Aravind Eye Care System by Pune Netra Seva Pratishthan.

### Legend in Ophthalmology Award

Madurai, July 28

On the eve of Doctors' Day celebration, Dr. P. Namperumalsamy was honoured with the award by the Indian Medical Association, Madurai in appreciation of his meritorious medical services.

### Special Honour at iBeach Film Festival

Goa, August 30-September 1

Dr. P. Namperumalsamy was honoured for his commendable contribution to Indian ophthalmology at iBeach Film Festival, the first of its kind ophthalmic meeting conducted by Prasad Netralaya, Udipi.

### Dr. Gullapalli N Rao Endowment Lecture

Gurugram, Haryana, February 13-16

Dr. M. Srinivasan, Director Emeritus, AECS delivered the lecture at All India Ophthalmic Conference.

### Institution Builder Award

Kolkata, November 29 – December 1

The International Society of Manual Small Incision Cataract Surgeons (ISMSICS) honoured Mr. Thulasiraj

Ravilla, Director-Operations, AECS with the award in recognition of his exemplary contributions towards building Aravind Eye Care System. The award was presented at the Comprehensive Cataract Conference held in Kolkata.

### Chittagong Eye Infirmary and Teaching Complex (CEITC) Gold Medal

Chittagong, Bangladesh, February 09

Mr. Thulasiraj Ravilla was honoured with a gold medal for his significant contribution to the development of CEITC at its 47th anniversary celebration.

### Albert Lee Ueltschi Award

Kolkata, November 29-December 1

At the Comprehensive Cataract Conference held in Kolkata, HelpMeSee honoured Dr. R.D. Ravindran, Chairman, AECS with the award in recognition of his outstanding contribution to ophthalmology.

### Dr.S. Mohandas Memorial Oration Award

Kollam, October 29

Dr. R.D. Ravindran delivered the oration titled, *Ensuring safety and improving outcomes in cataract surgery* at Ashtamudi Ophthalmica, the annual CME of Kollam Ophthalmic Association.

### Elected as Vice President-Tamil Nadu Ophthalmic Association (TNOA)

Salem, August 9-11

Dr. R. Ramakrishnan, Advisor, Aravind-Tirunelveli was elected as Vice President - TNOA at its annual conference held in Salem.

### American Academy of Ophthalmology (AAO) "Unsung Hero"

January 23

Dr. S.R. Rathinam, Chief, Uvea Services, Aravind-Madurai was recognised as an "Unsung Hero" by the AAO in appreciation of her work on trematode eye disease in children.

### Prof. Michael Trese Oration Award

Chandigarh, June 21-23

Dr. V. Narendran, Chief Medical Officer, Aravind-Coimbatore delivered the oration on *My journey with RoP* at the 4th annual conference of Indian Retinopathy of Prematurity Society.



*Dr. P. Namperumalsamy receiving the Pune Netra Seva National Award for AECS*



*Dr. P. Namperumalsamy being honoured at iBeach Film Festival*



*Mr. Thulasiraj Ravilla receiving the Institution Builder Award*

*Dr. M. Srinivasan receiving the Dr. Gullapalli N Rao Endowment Lecture Award*



*Dr. R.D. Ravindran receiving the Albert Lee Ueltschi award*

*Dr. N. Venkatesh Prajna at the grand reception by Her Majesty Queen Elizabeth*





*Dr. M.K. Mehra Oration Award to Dr. Usha Kim*



*Mr. Thulasiraj Ravilla being honoured for his contribution to the development of CEITC*



*Prof. Anila Khuteta Memorial Oration Award to Dr. Haripriya Aravind*

*Prof. Michael Trese Oration Award to Dr. V. Narendran*



*Dr. Haripriya Aravind receiving the P. Siva Reddy International Award*



*Dr. N. Venkatesh Prajna receiving Dr. J. Agarwal Excellence in Teaching Award*



*IAPB Eye Health Hero Award for Mr. N. Vengadesan*



### **Intraocular Implant and Refractive Society of India (IIRSI) Gold Medal**

New Delhi, September 7-8

Dr. Kalpana Narendran, Senior Medical Officer, Aravind-Coimbatore was awarded the gold medal for her outstanding achievements and selfless dedication towards advancement in the field of ophthalmology.

### **Dr. S.S Badrinath SOA SN Alumni Medal**

Salem, August 9-11

Dr. Kalpana Narendran was bestowed with the medal at the Annual Conference of Tamil Nadu Ophthalmic Association.

### **Dr.TNC Vedantham Memorial Oration**

Chennai, September 8

Dr. R. Kim, Chief Medical Officer, Aravind - Madurai delivered the oration on *Diabetic Retinopathy and Artificial Intelligence* at RADNET 2019 organised by Radhatri Netralaya.

### **Best Doctor Award**

Chennai, October 25

Star Vijay network and Rishvanth Tele Media honoured Dr. R. Kim with the award.

### **Excellence in Teaching Award**

Salem, August 9-11

Dr. N. Venkatesh Prajna, Director Academics -AECS was bestowed with the Dr. J. Agarwal Excellence in Teaching Award at the Annual Conference of Tamil Nadu Ophthalmic Association.

### **Vocational Excellence Award**

Madurai, July 30

Rotary Club of Madurai Blossom presented the award to Dr. Usha Kim, Chief-Orbit, Oculoplasty, Ocular Oncology and Ocular Prosthetics Services, Aravind-Madurai in appreciation of her exemplary contribution in the field of medicine and her commitment and dedication to high moral and ethical values.

### **Dr. M.K. Mehra Oration**

Lucknow, November 16

Dr. Usha Kim delivered the oration on the topic, *My Journey in the field – Evolution of the Department of Orbit, Oculoplasty & Ocular Oncology*.

### **Exceptional Woman of Excellence Award**

Madurai, January 26

Dr. Usha Kim was honoured with the award by the Women Economic Forum (WEF).

### **International Women's Day Awards**

Rotary Club, Madurai presented Elegance of Womanhood Award of Excellence to Dr. Usha Kim. Lady Doak College, Madurai and Transgender Resource Centre honoured Dr. Usha Kim with Achievers' Award in recognition of her efforts to build an equal society. She was also honoured by South India Welfare Trust - Association of Deaf, Madurai and Devadoss Hospital, Madurai on the occasion of International Women's Day.

### **Role Model of the Year Award**

Bengaluru, September 8-10

Women Ophthalmologists Society honoured Dr. Haripriya Aravind, Chief-Cataract and IOL Services, Aravind - Chennai with the award at its annual conference.

### **P.Siva Reddy International Award**

Gurugram, Haryana, February 13-16

Dr. Haripriya Aravind won the award at the All India Ophthalmic Conference for her significant contribution to the field of ophthalmology.

### **Prof. Anila Khuteta Memorial Oration**

Jaipur, September 20-22

Dr. Haripriya Aravind delivered the oration on *Intracameral antibiotics for endophthalmitis prophylaxis* at the Rajasthan Ophthalmological Conference.

### **Eye Health Hero**

Mr. N. Vengadesan, Manager-Patient Care, Aravind - Pondicherry was recognised with the award by the International Agency for Prevention of Blindness (IAPB)

### **Best Nurse Award**

Tirunelveli, May 12

Ms. K. Sangeetha, Aravind Community Clinic, Sankarankoil was felicitated by Red Cross Society with the award on the occasion of International Nurses Day.

### **Lions Club Awards**

Tirunelveli, June 6

Senior nurses of Aravind-Tirunelveli - Ms. A Shanmuga Sundari; Ms. A Prema; Ms. G.V. Packialakshmi, and Ms. R.S. Gomathi, were awarded Certificate of Achievement for their selfless and efficient work by the Lions Club of Tirunelveli Cosmos.

### **Distinguished Alumni Award**

Coimbatore, January 26

Ms. S. Sangeetha, Manager-Administration, Aravind-Coimbatore, was presented with the award by Dr.NGP Arts and Science College, Coimbatore.

## ACHIEVEMENTS

Staff are encouraged to attend conferences and CMEs to present their work. Over 50 staff won awards for their presentations in various academic programmes

### Proficiency Awards

By The Tamil Nadu Dr. MGR Medical University, Chennai

- Dr. Sivagami.N was awarded the Dr. Rema Mohan Gold medal for securing the highest mark in the Diploma in Ophthalmology exams (DO) in 2018.
- Dr. M.S. Lakshmi was awarded Dr. Rema Mohan Gold Medal and Thiru. C.K. Kumaraswamy 51st birthday commemoration Gold Medal for securing highest marks in the MS Ophthalmology exam in 2019.
- Dr. B. Harini Krishna was awarded the Dr. Rema Mohan Gold Medal for securing highest mark in Diploma in Ophthalmology exams in 2019.

Dr. Arkaprava Pradhan, Senior resident, Aravind-Tirunelveli won the Dr. G. Venkataswamy Gold Medal in the All India DNB final exam held in 2018.

### Annual Conference of VISION 2020: The Right to Sight - India

Aravind-Chennai, June 8-9

- Dr. D. Chandrasekhar, Medical Consultant, Aravind-Coimbatore,

Best Free Paper award, *Effectiveness of infection control nurse in implementing infection control practices and reducing hospital-acquired infection.*

- Ms. Rajakumari, Aravind-Coimbatore, Runner up in Free Paper Presentation, *Improving cataract surgery acceptance rate by utilising multiple tools during cataract counselling.*
- Ms. Ramyadevi, Aravind - Coimbatore, Best Free Paper award, *Outcomes of telescreening for RoP in rural south India - The Aravind Coimbatore experience.*
- Ms. S.N. Kamatchi, Aravind-Madurai, Runner Up in Free Paper presentation, *Analysis of high retention of clinical research participants in clinical trials conducted in south Indian population.*
- Dr. Hema, Medical Consultant, Aravind- Theni, Runner Up in Free Paper presentation, *Telemedicine approach for Retinopathy of Prematurity screening in rural areas: Opportunities and challenges.*
- B.Vengadesh, Vision Rehabilitation Services, Aravind-Madurai, Best Free Paper award, *Non-visual desktop access computer training for visually impaired persons.*
- I.Seran, Manager, Aravind-Salem, Runner Up in Free Paper presentation, *To analyse the incidence of wrong refraction and wrong glass prescriptions across all Aravind*



Ms. Lakshmi with her award winning poster at VISION 2020 conference

Eye Hospitals by the incidents reported in the year 2018.

- Ms. Lakshmi, Refraction Department, Aravind-Madurai, Best Poster award, *Improving visual outcomes with miniscleral lens in keratoconus.*
- Ms. Rajathi, Gandhigram Vision Centre, Ms. Moorthi Gowsalya, Technician, Aravind-Madurai and Ms. Amirtha Varshini, Optometrist, Aravind-Madurai, First, Second and Third Prize respectively in Optometry Quiz.

### Paediatric Retina Summit

Chennai, July 11-13

- Dr. Harshal Gondhale, Medical Officer, Retina Services, Aravind-Madurai, award for the best photograph, *Combined hamartoma of retina and RPE.*
- Dr. Prerana Shah, second prize for the video, *Raising the barrier for pars plana vitrectomy for retinopathy of prematurity.*

Dr. MGR Medical University Convocation - Shri. Banwarilal Purohit, Hon'ble Governor of Tamil Nadu distributing gold medals to...



Dr. N. Sivagami



Dr. B. Harini Krishna



Dr. M.S. Lakshmi



## Intraocular Implant and Refractive Society of India (IIRSI) Film Festival Awards

Chennai, July 6-7

Doctors from Aravind-Pondicherry bagged several awards.

- Dr. R. Venkatesh, Chief Medical Officer and Dr. M.G. Pavan Kumar, Medical Consultant became runner up, *Family screening-An effective way to combat glaucoma blindness*
- Dr. Prasanth Gireesh, Medical Consultant, runner up for the video, *Piggyback phacoemulsification of hypermature, Morgagnian and phacolytic cataracts.*
- Medical Consultants, Dr. V. Rajesh and Dr. Sathish Kumar Muddana received special mention for their videos, *3D printer in ophthalmology and Big data, big change.*

## Cutting Edge 2019: A Symposium beyond Trabeculectomy

Pondicherry, July 13 - 14

Dr. P.R. Aswin, Medical Officer, General Ophthalmology, Aravind-Madurai, first place in Shark Tank event and quiz competition.

## Winner – Image Nation

Trivandrum, July 19-20

Dr. Ayshwaria Basker, Retina Fellow, Aravind-Pondicherry emerged winner of the contest, Image-Nation, organised as part of the Retina Imaging Congress conducted by Chaithanya Eye Hospital, Trivandrum.

## Annual Conference of Tamil Nadu Ophthalmic Association

Salem, August 9-11

- Dr. Haripriya Aravind, Dr. M N Endowment Award for the Best Free Paper in cataract.
- Madurai Warriors team consisting of Dr. Usha Kim, Dr. Preethika Gandhi, Medical Officer, Cornea Services, Aravind-



Dr. Haripriya receiving the Dr. MN. Endowment award for the Best Free Paper at TNOA

- Madurai; Dr. Aswin, Medical Officer, Aravind-Madurai and Dr. B. Pranesh, Medical Officer, General Ophthalmology, Aravind-Coimbatore: Winner, *Ophthalmic Premier League.*
- Dr. S. Kavitha, Medical Consultant, Glaucoma Services, Aravind-Pondicherry, Best Paper Award in Glaucoma, *Corneal endothelial cell density changes six months after laser peripheral iridotomy – A prospective study.*
- Cornea consultants, Dr. N. Shivananda, Aravind-Pondicherry and Dr. R. Seema, Aravind-Chennai, Best Paper Award in Cornea, *A piggyback solution for a piggyback problem*
- Dr. M.G. Pavan Kumar, Medical Consultant, Glaucoma Services, Aravind-Pondicherry, Best Paper Award in Comprehensive Ophthalmology, *A self sufficient mobile eye clinic model for developing countries.*
- Dr. Vedhanayaki, Consultant, Uvea Services, Aravind-Madurai Best Paper Award in Uvea, *Role of newer biologicals in the management of recalcitrant non-infectious uveitis.*
- Dr. B. Pranesh, Aravind-Madurai Best Presentation in *One case one pearl Session.*
- Dr. Arun and Dr. Rishabh Desai, DNB Residents, Aravind-Tirunelveli, First Prize in ET Selvam Quiz Competition.



Dr. Ashok Vardhan with the Orbis International Medal for Best Free Paper Presentation at ESCRS conference

## Orbis International Medal

Paris, France, September 14-18

Dr. Ashok Vardhan, Chief Medical Officer, Aravind - Tirupati received the medal for the Best Free Paper Presentation, *High cataract surgical rate and universal eye care delivery model bringing elimination of cataract blindness in Theni district, India* at the 37th Congress of the European Society of Cataract and Refractive Surgeons (ESCRS).

## Best Paper Award

Lucknow, September 20-22

Dr. Swati Upadhyaya, Glaucoma Consultant, Aravind-Pondicherry won the award for her paper titled *Validation of a head-mounted virtual reality visual field screening device* at the Annual Conference of Glaucoma Society of India.

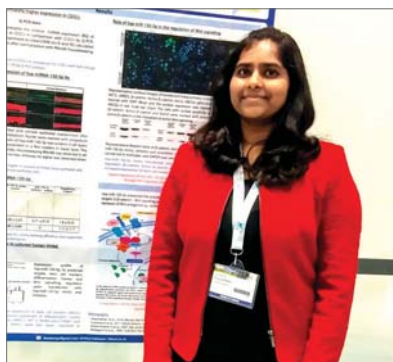
## Best of Best Free Paper Award

Kakinada, September 27-29

Dr. Ramya Seetam Raju, Medical Consultant, Cornea & Refractive Services, Aravind - Madurai won the Best of Best Free Paper Award from amongst 75 competitive papers at the Annual Conference of Andhra Pradesh Ophthalmic Society. The title of the paper is *"Does contemporary antimicrobial substitution in corneal storage media reduce donor rim contamination?"*



Dr. Kunal Ashok Mandlik, winner-photo contest by the CRST Europe



Ms. K. Lavanya - Best Poster award at EVER Congress



Ms. Rudhra receiving the Best Poster award at IERG meeting

### Qualified NABH Assessor

Dr. D. Chandrasekhar, Medical Consultant, Aravind-Coimbatore was certified as an assessor by the National Accreditation Board for Hospitals and Healthcare providers (NABH) in September 2019 for carrying out assessment of hospitals.

### Best Poster Awards

Ms. K. Lavanya, Senior Research Fellow, Department of Immunology and Stem Cell Biology, AMRF won the award for her poster titled, *Hsa-miR-150-5p regulates human corneal epithelial stem cells through Wnt signalling* at the XXII European Association for Vision and Eye Research (EVER) Congress held in Nice, France, from October 17-19.

Ms. O. Rudhra, Junior Research Fellow, Department of Microbiology, AMRF won award for the poster titled, *Surface Proteome and Surface Morphology of Melanised and Non-melanised Conidiospores of Aspergillus flavus* at the annual conference of Indian Eye Research Group held in Chennai from July 26 to 28. She also won the award for her poster, *Identification of causative organism of infectious keratitis using NGS method* at the International Conference on Synergy of Sciences held at SASTRA Deemed University, Thanjavur, from February 27-29.

### Video presentation - Second Prize

Kolkata, November 29-December 1 Dr. Madhu Shekhar, Chief, Cataract Services, Aravind-Madurai won second prize for the video titled "*Iridodialysis Repair- Simplified Approach*".

### Winner - Photo Contest

Dr. Kunal Ashok Mandlik, Medical Consultant, Cornea and Refractive Services, Aravind-Pondicherry won the photo contest in *Ocular Trauma category in the Journal of Cataract and Refractive Surgery Today (CRST) Europe*.

### Erudio-Allergan Academic Achievers Award

DNB Residents, Dr. Gawankar Shweta Yogesh, Aravind-Coimbatore and Dr. Raksheeth Nathan, Aravind-Theni won the first and third prize respectively at the national level quiz programme for postgraduate students in ophthalmology.

### Annual Conference of Cornea Society of India

Kumarakom, Kerala, December 13-15 Dr. Josephine Christy, Cornea and Refractive Services, Aravind-Pondicherry, bagged First Prize in photo contest.

Dr. R. Naveen, Cornea and Refractive Services, Aravind-Madurai won First Prize in Just a Minute session.

### Annual Meeting of the Indian Pediatric Glaucoma Society

Hyderabad, December 7-8

Dr. Hiruni K Wijesinghe, Glaucoma Fellow, Aravind-Madurai won Best Poster award for, *A comparative study of glaucoma drainage device surgery in children and adults*.

Dr. Srilekha Pallamparthy, Glaucoma Fellow, Aravind-Madurai won the session on *Clinical challenges in paediatric glaucoma* for the presentation, *A case of unilateral congenital glaucoma associated with microcephaly and ipsilateral hemiplegia*.

### Association of University Professor of Ophthalmology (AUPO) Resident & Fellow Research Forum Award

Dr. Siddharth Narendran, Medical Officer, Aravind Eye Hospital, Madurai, currently pursuing Fellowship at University of Virginia, Charlottesville, USA received the award. This is the first time an ophthalmologist trained in India has received the award.

### Best Poster Award

Chennai, December 7-8

Dr. Mahima Bankar, Fellow-Paediatric Ophthalmology Services, Aravind-Pondicherry, award for the poster, *Normative data of paediatric OCT in South population* at the Annual Conference of Strabismus and





Dr. Srilekha Pallamparthi receiving award for the best case presentation



Dr. Hiruni K Wijesinghe receiving the Best Poster award

Paediatric Ophthalmology Society of India.

### Awards at All India Ophthalmic Conference 2020

Gurugram, Haryana, February 13-16

- Dr. Haripriya Aravind received Sante Vision award for Best Paper.
- Dr. N. Venkatesh Prajna, Dr. S.Senthilkumari, AIOS-IJO Silver Award for best publication in IJO 2019 for the publication, *Human amniotic membrane as a drug carrier - An in-vitro study using fortified cefazolin ophthalmic solution.*
- Dr. Madhu Shekar, Chief - Cataract Services, Aravind-Madurai - Winner of New Technique: Film Festival of AIOC (FIFA) for the video

titled, *Iridodialysis repair - simplified approach.*

- Dr. Manavi D Sindal and Dr. Harshal Pradeep Gondhale, Retina consultants, Aravind-Pondicherry, Best Paper award, Poster podium presentation.
- Dr. O. Annamalai, Medical Consultant - Glaucoma Services, Aravind-Pondicherry, Runner up in Microvision Quiz 2020
- Dr. Pranesh, Medical Officer-General Ophthalmology, Aravind-Coimbatore, First prize in National YOSI Writing Competition.
- Dr. Prithvi Chandrakanth, General Ophthalmology Fellow, Aravind-Coimbatore, Best publication in IJO 2019.
- Dr. Mano Aarthi, Final year DNB Resident, Aravind-Theni,

Best presentation in Neuro-ophthalmology- Poster podium session for the presentation titled, *Anterior ischemic optic neuropathy and central retinal artery occlusion in Takayasu arteritis.*

- Dr. Shishir Verghese - Best Paper Award in Neuro-ophthalmology session, *Assessment of retinal manifestations of Parkinson's disease using OCT: A study in Indian eyes.*
- Dr. Piyush Kohli - Best Video Award for the video titled, *Tips and tricks in vitreoretinal surgeries.*

### Best Case Presentation Award

Dr. Mano Aarthi, DNB Resident, Aravind-Theni received 1st prize in case presentation at the Postgraduate Talent Fest conducted by Thanjavur Medical College on March 14.

Dr. Haripriya receiving the Sante Vision award for Best Paper



Dr. Madhu Shekar with the FIFA - AIOC award



# Aravind Eye Foundation

Aravind Eye Foundation was founded in 2000 to support Dr. G. Venkataswamy's mission to eliminate needless blindness through a combination of philanthropy, volunteerism and strategic partnering. Foundation board members and advisors come from a wide variety of fields, including clinical care, medical research, accessible technology and new product development, venture capital, and healthcare management. Aravind's core patient services are self-sustaining, so the foundation works to scale existing programs or stimulate new research and service development.

## Ring of Hope

Since its founding in 2004, Aravind's Ring of Hope program has supported 9,370 patients including adults with ocular tumours and saved the sight and lives of 1,716 patients suffering from retinoblastoma, a virulent, often fatal eye cancer, primarily affecting ages 0 to 5 years.

This past year, Aravind expanded its Ring of Hope program to provide care for adult patients suffering from eye cancer and to pay for rehabilitation services. Cancer treatment can be a catastrophic event for a family, burdening them with debt they can never repay. If the patient is the main wage earner for the family, there is the additional strain of lost income.

Biju and his daughter Kirthiga are two of Aravind's courageous survivors. As a child, Biju had retinoblastoma and had both his eyes removed. Completely blind, he has had difficulty finding work. A

school employed him as teacher for some time, but later he had to quit. He married, and a year later the couple was blessed with baby girl Kirthiga. The mother noticed a white reflex in the baby's eyes, and they brought her to Aravind. Kirthiga was just one and a half years old when she was diagnosed with cancer in both eyes. One eye had to be removed and the other one is undergoing chemotherapy. Her father Biju is now receiving rehabilitation services at Aravind, also free of cost. He hopes to go back to work and support his family.

Aravind Eye Foundation is grateful to the Madison Community Foundation Jaya G. Iyer Endowment Fund, the Umberto Romano and Clorinda Romano Foundation, the Sohum Foundation, the Yvette and Derryk Dias Foundation, Dr. and Mrs. William B. Stewart, and the many individuals who support Aravind's patients and their families.

## Spectacles for Scholars

Poor eyesight adversely impacts a child's ability to learn, since 80% of learning happens visually, and affects future employment and economic prosperity. Around the world, an estimated 12 million children have visual impairments that can be corrected with a pair of spectacles. Aravind's Spectacles for Scholars program addresses this problem with free vision screening and eyeglasses to school children in low-income areas. Through a multi-year partnership with WarbyParker, the US retail and online eyewear company, Aravind screened 254,000 children and distributed 12,446 pairs of spectacles this year.

*Vision screening at Sivananda Vidyalayam Matriculation School, Aruppukottai*

*Mr. Biju and his daughter Kirthiga*





## Rural Vision Centers

Rural vision centers are the cornerstone of Aravind's goal to make basic eye care accessible to all. Each center serves a population of 50,000 to 70,000 and is connected to one of the base hospitals via Aravind's award-winning teleophthalmology system. Aravind Eye Foundation provides the seed capital for a center's set-up and the first year's operating costs; most centers are break-even by year two from fees and eyeglass sales.

Since 2011, the foundation has sponsored 16 vision centers, providing basic eye care for nearly 130,000 patients. 4,834 patients have been referred to various Aravind hospitals for cataract surgery and more than 15,000 patients have ordered glasses.

## Research

Aravind's genetic testing program for Retinoblastoma has helped more than 250 patients and their families through 1) precise identification of their cancer's genetic cause, leading to improved treatment, 2) assessment of risk for future generations, and 3) eliminating the possible risk of secondary cancers during their lifetime.

Aravind has expanded its successful genetic testing program to cover all ocular tumors affecting adults, as well as children. At eye hospitals in India, patients are frequently seen with aggressive lymphoma and melanoma tumors, which are deadly if not diagnosed and treated on time. These tumors affect mainly adults in the working-age group, and most of them lose their battle with cancer due to advanced stage of the disease, leaving their families bereft and without means of support. Prediction and early detection can save their lives.

Aravind is in a unique position to conduct genetic testing, because of its high patient volumes and the close connection between its hospitals and the medical



Genetic testing for retinoblastoma

research facility. Genetic testing for eye cancer costs around \$2000 per patient in most labs around the world, but Aravind provides the same tests at \$250 in India, due to lower cost lab techniques.

Thank you to the Madison Community Foundation's Jaya G. Iyer Endowment Fund and the Sohum Foundation for helping us to expand the genetic testing program.

## Capacity Building

Dr. V's mission to eliminate needless blindness knows no borders. Aravind trains staff and advises hospitals in other parts of India and other countries to expand capacity and improve the quality of eye care.

Currently, Aravind is working with hospitals in Northern India, thanks to a grant from MAQ Software and hospitals throughout India and Bangladesh with support from the Lavelle Fund for the Blind. Aravind Eye Foundation is also thankful to the Conrad N. Hilton for their support of Aravind's work in Sub-Saharan Africa.

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*"Intelligence and capability are not enough.  
There must be the joy of doing something beautiful."  
(From the journals of Dr. G. Venkataswamy)*

*Aravind Eye Foundation is deeply  
grateful to the many supporters and friends who  
participate in the joy of Aravind's vision.*



# Partners in Service

Aravind is ever grateful to organisations and individuals for their contributions in its mission of restoring sight. The organisation acknowledges their whole-hearted support and looks forward to a continuing journey of partnership.

## For service delivery, training and more

- Alcon Laboratories Inc, USA
- Carl Zeiss Meditec, Germany
- CBM International, Germany
- Centre for Innovation in Public Systems, Hyderabad, India
- Combat Blindness Foundation, USA
- Conrad N. Hilton Foundation, USA
- Dana Center, Johns Hopkins University, USA
- Essilor, India
- Fred Hollows Foundation, Australia
- General Insurance Corporation of India, Mumbai, India
- HCL Foundation, New Delhi, India
- Indian Overseas Bank, India
- International Agency for Prevention of Blindness, UK
- International Council for Ophthalmology, USA
- Kaushal Devendra Gupta, Pune, India
- Lavelle Fund for the Blind, USA
- Lions Clubs International Foundation, USA
- London School of Hygiene & Tropical Medicine, UK
- Manohar Devadoss, Chennai, India
- Mehra Eyetechn Private Limited, Puducherry
- Novartis, Switzerland
- ORBIS International, USA
- Rotary International, USA
- Schwab Foundation and Social Entrepreneurship, Switzerland
- Seva Canada
- Seva Foundation, USA
- Shyam Prakash Gupta, Madurai, India
- SightLife, USA
- SightSavers, UK
- State Bank of India, India
- Standard Chartered Bank & Scope Intl, UK

- So-Hum Foundation, USA
- Subroto Bagchi, Odisha, India
- The Queen Elizabeth Diamond Jubilee Trust, UK
- The Tamil Nadu Dr. MGR Medical University
- Tirumala Tirupati Devasthanams, India
- TOMS, USA
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- VISION 2020 - The Right to Sight, India
- Wescott Williams Ltd., UK
- World Diabetes Foundation, Denmark
- World Health Organization, Switzerland
- XOVA: Excellence in Ophthalmology Vision Award, USA

## For research

- Alagappa University, Karaikudi, India
- Aravind Eye Foundation, USA
- Cognizant Foundation, Chennai, India
- Cornell University, Ithaca, USA
- Council of Scientific and Industrial Research, New Delhi, India
- Department of Biotechnology, New Delhi, India
- Department of Health Research, New Delhi, India
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- Hitchcock Medical Center, Lebanon NH, USA

- India Alliance, Hyderabad, India
- Indian Council of Medical Research, New Delhi, India
- Indian Paediatric Glaucoma Interest Group (IPGI), Chandigarh
- Indian School of Business, Hyderabad
- John Hopkins University, USA
- Kellogg Eye Center, University of Michigan, USA
- London Business School, UK
- Madurai Kamaraj University, Madurai, India
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- Moorfields Eye Hospital, London
- National Eye Institute, USA
- National Healthcare Group Eye Institute, Tan Tock Seng Hospital, Singapore
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- Neuroptics Research Laboratory, Berkeley, USA
- Peninsula Eye surgery centre, Los Altos, CA
- Pondicherry University, Pondicherry, India
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- Proctor Foundation, University of California, San Francisco, USA
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- Queens University Belfast, UK
- Sastra University, Thanjavur, India
- Science and Engineering Research Board, New Delhi, India
- Seva Foundation, USA
- Singapore Eye Research Institute, Singapore
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- Singapore National Eye Centre, Singapore
- State University of New York (SUNY), Buffalo, New York, USA
- Sun Pharma, Mumbai, India
- Tufts School of Medicine, Boston, Massachusetts, USA
- Unite des Aspergillus, Institut Pasteur, Paris
- University College, London
- University of California, Berkeley, USA
- University of California, San Francisco, USA
- University of Liverpool, Liverpool, UK
- University of Ulster, Northern Island, UK
- Vision Research Foundation, Sankara Nethralaya, Chennai, India
- Wellcome Trust, UK
- Wills Eye Hospital, Philadelphia, USA
- World Health Organization, Switzerland



Aravind took great pride in hosting a community event to celebrate Mr. Manohar Devadoss, a long-time friend and supporter of Aravind, being awarded the Padma Shri. The event was organised in collaboration Madurai Readers' Club.



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R. RAMESH BABU, BA, MA  
Electrical Engineer  
N. BALAKRISHNAN, ME  
Manager-Electrical  
R.V. VISHNU KUMAR, DECE  
Manager - IT & Systems  
S. RAJKUMAR, M.SC  
Manager-Vision Centre  
G. JHANSI SUNITHA, MA  
Manager-Stores  
PR. SIGAPPI, MSW  
Librarian  
Dr. R. GOVIDARAJAN, M.LLSC, PH.D

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## ARAVIND-THENI

Chief Medical Officer  
Dr. DIPANKAR DATTA, DO, DNB, MNAMS,  
(OPH)  
Medical Consultants  
Dr. D. HEMA, MS  
Dr. V. BALAJI, MS  
Dr. K. DHANYA, DO, DNB  
Dr. J. ASHOK, MS  
Dr. MOURYA DEVILA PALLI, MS

## NURSING

Nursing Superintendents  
R. SEENIAMMAL  
R. GOWRI

## ADMINISTRATION

Manager-Vision Centre  
R. BALASIVA, BA, MSW  
Manager-Camp  
V. JEYARAJ, BA  
IT & Systems  
K. SARAVANAN, B.SC

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## ARAVIND-TIRUNELVELI

Advisor  
Dr. R. RAMAKRISHNAN, MS, DO  
Chief Medical Officer  
Dr. R. MEENAKSHI, DO, DNB

## RETINA-VITREOUS SERVICES

Chief  
Dr. SYED MOHIDEEN ABDUL KHADAR,  
MS  
Medical Consultants  
Dr. UTPAL HALDER, MS  
Dr. VINIT SHAH, DNB  
Dr. ADHEESH P. SHETTY, MS  
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## INTRAOCULAR LENS & CATARACT SERVICES

Chief  
Dr. SHIVKUMAR CHANDRASHEKHARAN,  
MS

Medical Consultants  
Dr. M. SHERIN HAROON, MS  
Dr. ABHIJITH, MS

## CORNEA & REFRACTIVE SURGERY SERVICES

Chief  
Dr. V. ANITHA, DNB, FAICO  
Medical Consultants  
Dr. ADITYA SANJEEV GHORPADE, DNB  
Dr. SHOBITA NAIR, DNB

## PAEDIATRIC OPHTHALMOLOGY & ADULT STRABISMUS SERVICES

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Dr. R. MEENAKSHI, DO, DNB  
Medical Consultants  
Dr. A. FATHIMA, MS  
Dr. SABYASACHI CHAKRABARTY, DO, DNB  
Dr. NEELAM PAWAR, MS  
Dr. ANURAAG S. GANDHI, DNB

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Dr. MOHIDEEN ABDUL KADER, DNB  
Medical Consultants  
Dr. R. RAMAKRISHNAN, MS, DO  
Dr. DEVENDRA MAHESWARI, MS  
Dr. R. AARTHY, MS  
Dr. R. SINDHUSHREE, MS  
Dr. SHYLESH DABKE, MS  
Dr. K.V. SARANYA, MS  
Dr. SANJANA SURESH RAO, DNB  
Dr. ASHWIN SEGI, MS

## ORBIT, OCULOPLASTY AND OCULAR ONCOLOGY SERVICES

Chief  
Dr. V. MANEKSHA, MS

## NEURO-OPHTHALMOLOGY SERVICES

Chief  
Dr. S. PADMAVATHY, MS

CONSULTANT ANAESTHETIST  
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D.A

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Medical Consultants  
Dr. R. RAMAKRISHNAN, MS, DO  
Dr. S. PADMAVATHY, MS  
Dr. V. MANEKSHA, MS  
Dr. KAVYA, DO

## VISION REHABILITATION CENTRE

Dr. A. FATHIMA, MS



### FREE HOSPITAL

DR. DIVIYAN ABRAHAM, MS

#### Manager

S. BALAKRISHNAN, PUC

### NURSING

#### Nursing Superintendents

V. ARUMUGAM

A. S. SHANMUGA SUNDARI

### ADMINISTRATION

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P. NAVANEETHA KRISHNAN, PUC

#### Public Relations Officer

M. MAHADEVAN, D.PHARM

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#### Manager-Quality & Inpatient Services

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#### Manager-Projects & Outreach

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M.N. CHIDHAMBARAM, PUC

#### Librarian

E. PERUMALSAMY, M.LISC, M.PHIL

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### ARAVIND-COIMBATORE

#### Chief Medical Officer

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#### Medical Consultants

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DR. KALPANA NARENDHAN, DO, DNB

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DR. HRIDYA MOHAN, MS

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#### Medical Consultants

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DR. P. MANGALA, DNB

DR. V. PRABHU, MS

DR. DEVI ROSETTE, MS

DR. N. KAVITHA, MS

DR. MAITRAYEE KAMMEN, MS

DR. ARJUN, DO, MS, DNB

DR. SNEHA PRABHU, MS

DR. P. SHALINI, MS

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#### Medical Consultants

DR. C. SANDRA, DO, DNB

DR. SASIKALA ELIZABETH, DNB

DR. AMRUDHA SINDHU, DNB

DR. SHILPA RAO, MS

DR. PATHIL PARTH AMARDEEP, DNB

DR. SRUSHTI D.S.

DR. VANATHI N, DNB

### GLAUCOMA SERVICES

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DR. SIVA PRASANNA T, MS

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#### Medical Consultant

DR. SHUBHANK KHARE, MS

### ORBIT, OCULOPLASTY AND OCULAR ONCOLOGY SERVICES

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#### Medical Consultants

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#### Medical Consultant

DR. M. KARTHIK KUMAR, DO

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#### Medical Consultants

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DR. P. VIVEKANAND, DO, DNB

DR. CHANDRASEKAR, MS

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DR. SENTHAMILSELVI, DO

DR. A. SRINILA, DO

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DR. BAGAVATH SHALINI, MS

DR. DEEPA, DNB

DR. DUGGIRALA VARUN, MS

DR. SUNADA SUBRAMANIAN, DNB  
DR. PRANESH, MS  
DR. SANGEETHA V, DO

### CITY CENTRE - ARAVIND EYE HOSPITAL, COIMBATORE

#### Medical Consultants

DR. ROHAN DANIEL DAWALIKAR, MS  
DR. MANJU VINYTERA, DNB  
DR. SUGANYA, MS

### NURSING

#### Nursing Superintendent

S. SULOCHANA

#### Assistant-Nursing Superintendent

R. RADHIKA

### ADMINISTRATION

#### Manager-Administration

S. SANGEETHA, MHA

#### Manager-HR

R. UMAPRIYA, MA, PTSTA

#### Manager-Personnel

R. JEBADURAI, BA, PGDPM

#### Manager-Transport

D. KARTHIKEYAN, DIP, COP

#### Manager-IT Systems

S. THIRUNAVUKKARASU, M.Sc, (IT),  
PGDSD

#### Manager-MRD

V. HEMALATHA, M.Phil

#### Manager-Quality Assurance

R. GAUTHAM KUMAR, M.Sc. HA

#### Manager- Patient Care

B. VIGNESH, MBA

#### Electrical Engineer

A.M. APPUSAMY, D.E.E.E

#### Civil Engineer

S. GANAPATHI, D.C.E

#### Librarian

K. ALAGUMANI, M.LI.SC, M.Phil

### ARAVIND-PONDICHERRY

#### Chief Medical Officer

DR. R. VENKATESH, DO, DNB

### RETINA-VITREOUS SERVICES

#### Chief

DR. MANAVI D. SINDAL, MS

#### Medical Consultants

DR. PANKAJA DHOBLE, MS  
DR. AYUSHI SINHA, DNB  
DR. ROSHNI MOHAN, MS  
DR. S. SIVARANJANI, MS  
DR. NIKITA SONAWANE, MS  
DR. DIVYA YADAV, MS

### INTRAOCULAR LENS & CATARACT SERVICES

#### Chief

DR. V.R. VIVEKANANDAN, MS

#### Medical Consultant

DR. MERLIN BENZY, MS

### CORNEA & REFRACTIVE SURGERY SERVICES

#### Chief

DR. N. SHIVANANDA, MS

#### Medical Consultants

DR. M. PURUSHOTHAMA RAJKUMAR, MS  
DR. JOSEPHINE CHRISTY, MS  
DR. V. RAJESH, MS  
DR. P.J. ARUNA, MS  
DR. KUNAL MANDLIK, MS  
DR. KULHARSH B JAISWAL, MS  
DR. RAKESH A. BETDUR, MS

### PAEDIATRIC OPHTHALMOLOGY & ADULT STRABISMUS SERVICES

#### Chief

DR. K. VEENA, DO, DNB

#### Medical Consultants

DR. MARIE FREDRICK MOUTTAPPA, DO, DNB  
DR. ANJALI KHADIA, MS

### GLAUCOMA SERVICES

#### Chief

DR. S. KAVITHA, MS

#### Medical Consultants

DR. SWATI UPADHYAYA, DO, DNB

DR. O. ANNAMALAI, DO, DNB  
DR. C.R. VISWARAJ, MS  
DR. M.G. PAVAN KUMAR, DO, MS, DNB  
DR. UMESH KRISHNA, MS  
DR. G. MEGHA, MS

### ORBIT, OCULOPLASTY & OCULAR ONCOLOGY SERVICES

#### Chief

DR. R. JAYAGAYATHRI, DO, DNB

#### Medical Consultant

DR. DAYAKAR YADALLA, MS, FRCS

### NEURO-OPHTHALMOLOGY SERVICES

#### Chief

DR. S. PRIYA, MS

### UVEA SERVICES

#### Chief

DR. S. BALA MURUGAN, MS

### GENERAL OPHTHALMOLOGY SERVICES

#### Medical Consultants

DR. D. BALAMURUGANANDARAJ, DO  
DR. R. SWETHA, DO  
DR. M. JANANI, DNB  
DR. N. SIVAGAMI, DO  
DR. V. GAYATHRI, DNB  
DR. K. VANISHREE, DNB  
DR. R. SWATHI, MS  
DR. A. BALRAJ, DIP.N.B

### NURSING

#### Nursing Superintendents

R.V. SELVARANI  
A. SUBBULAKSHMI

### ADMINISTRATION

#### Manager-Administration

V. SANTHANAM, B.Com

#### Manager-General

P. KANAGARAJ, BE

#### Manager-Human Resource

A. SUMATHI, MBA

#### Manager-Camp

A. XAVIER, B.Sc

#### Manager-Transport & Security

K. KAVERI, B.A



Manager-Maintenance

P. THANAPAL, DCE

Manager-Patient Care & Quality Assurance

N. VENGADESAN, MBA

Manager-Patient Care

K. KALAIVENDAN, MBA

Manager - IT & Systems

M. ASHOK, MCA

Manager - Free Hospital & Vision Centre

K. HARIKRISHNAN, BA

Manager - Stores

S. VADIVELMURUGAN, B.SC

Librarian

C. MAHALAKSHMI, M.LL.SC

---

## ARAVIND-SALEM

Chief Medical Officer

DR. B. MANOHAR BABU, MS

## CATARACT & UVEA SERVICES

CHIEF

DR. B. MANOHAR BABU, MS

## RETINA-VITREOUS SERVICES

Medical Consultant

DR. K. HEMALATHA, MS

## CORNEA & REFRACTIVE SURGERY

Medical Consultants

DR. J. ANUJA, MS,

DR. LOKESHWARI, MS

## GLAUCOMA SERVICES

Medical Consultants

DR. RAMESH, MS

DR. SAPNA, MS

DR. BHARAMARAMBA BANAGAR, MS

## GENERAL OPHTHALMOLOGY SERVICES

Medical Consultants

DR. M. LAVANYA, MS

DR. JAYASUDHA, DO

DR. KEERTHANA, MS

DR. UMA, MS

## NURSING SUPERINTENDENT

B.S. INDIRANI

## ADMINISTRATION

Manager-Patient Care

I. SERAN, MBA (HM); FEHM

Manager Accounts & Finance

SAKTHIVEL

IT & Systems

A. KUMARESAN, BCA

---

## ARAVIND-CHENNAI

Chief Medical Officer

DR. S. ARAVIND, MS, MBA

## RETINA-VITREOUS SERVICES

Chief

DR. ANAND RAJENDRAN, DNB, FRCS

Medical Consultants

DR. KARTHIK SRINIVASAN, MS

DR. PRABHU BASKARAN, MS, DNB

DR. INDU G, MS

## INTRAOCULAR LENS & CATARACT SERVICES

Chief

DR. HARIPRIYA ARAVIND, MS

Medical Consultant

DR. SUDHA PALANIAPPAN, DOMS, DNB, FICO

## CORNEA & REFRACTIVE SURGERY SERVICES

Chief

DR. K. TIRUVENGADA KRISHNAN, DNB

Medical Consultants

DR. M. DIVYA, MS

DR. SEEMA RAMAKRISHNAN, DO, DNB, FICO

## PAEDIATRIC OPHTHALMOLOGY & ADULT STRABISMUS SERVICES

Medical Consultant

DR. ANKITA BISANI, DO, DNB, FICO

## GLAUCOMA SERVICES

Medical Consultants

DR. NEETHU MOHAN, MS

DR. MADHURI, MS, DNB

DR. V. PRASANNA, MS, FICO

## UVEA SERVICES

Medical Consultant

DR. ELIZA ANTHONY, DNB

## ORBIT, OCULOPLASTY AND OCULAR ONCOLOGY SERVICES

Medical Consultants

DR. JAYASHREE, DO, DNB

DR. GAYATRI FULSE, DO, DNB

## NEURO-OPHTHALMOLOGY SERVICES

Medical Consultant

DR. NIRMALA DEVY, DO

## GENERAL OPHTHALMOLOGY

Medical Consultants

DR. R. JOSEPHINE SHYAMALA, DNB

DR. ANURADHA, DNB

DR. AARTHY, MS

## ANAESTHETIST

DR. JACINTHA, DNB, DA

## PHYSICIANS

DR. JOEIMON, MD, DMM

DR. J.P. JANISH PRABHAKAR, MBBS

## ADMINISTRATION

Manager-Finance & Insurance

P. POOBALAN, B.COM

IT & Systems

AJMAL HUSSAIN, BCA, DCE

---

## ARAVIND-TIRUPATI

Chief Medical Officer

DR. ASHOK VARDHAN, DO, DNB

## RETINA-VITREOUS SERVICES

Medical Consultants

DR. Y. C. VENUGOPAL REDDY, MS

DR. UPENDRA BABU, MS

## INTRAOCULAR LENS & CATARACT SERVICES

Medical Consultant

DR. PREETI MOHANTY, MS, DNB

## CORNEA & REFRACTIVE SURGERY SERVICES

### Medical Consultant

DR. BALAKRISHNA BALAKA, MS

## PAEDIATRIC OPHTHALMOLOGY & ADULT STRABISMUS SERVICES

### Medical Officer

DR. SATHYA T. RAVILLA, MS

## GLAUCOMA SERVICES

### Chief

DR. S. ASHOK VARDHAN, DO, DNB

### Medical Consultants

DR. SREENATH, DO, DNB

DR. VIJAYALAKSHMI ALLE, MS

DR. SWATHI, DNB

## ANAESTHETIST

DR. M. SAJITH, MD

## PHYSICIANS

DR. UJJWALA, MD

DR. BOLLU KEERTHI, MD

## ADMINISTRATION

### Manager-Administration & Finance

K. KESAVA KUMAR, B.SC. B.ED, L.L.B,

### Manager-Patient Care,

DAMIEN JACOB, MBA

### Manager-Camp & Liaisoning Officer

N.S. RAVI, M.SC., HDC

### Manager-Maintenance

VENKATESWARULU THOTA, B.TECH  
(CIVIL)

### IT & Systems

M. SANKAR, B.TECH

## ARAVIND-TIRUPUR

### Medical Consultants

DR. PRIYANKA R, MS

DR. NEDHINA E.K, DNB

## ARAVIND-DINDIGUL

### Medical Consultants

DR. P. NANDA KISHORE, DO, DNB

DR. R. VIGNESHWAR, MS

### Manager

R. BALASUBRAMANI, M.SC

## ARAVIND-TUTICORIN

### Medical Consultants

DR. G. ANITHA, DO, DNB

DR. S. KANIMOZHI, MS

### Manager-Patient Care & Administration

N. MOHAMMED GHOUSE, MBA

### Manager-Office

A. NAMMALVAR, B.SC

## ARAVIND-UDUMALPET

### Medical Consultants

DR. JEBINTH BRAYAN, MS

DR. MOHAMED FAHEEM, MS

DR. MANU THOMAS, MS

### Manager-Office

V. MOUNA GURUSAMY

## ARAVIND-KOVILPATTI

### Medical Consultant

DR. M. SIVADARSHAN, MS

## Aravind Integrated Eye Bank Services (AIEBS)

### Director

DR. M. SRINIVASAN, MS, DO, FAMS

## ROTARY ARAVIND INTERNATIONAL EYE BANK, MADURAI

### Technical Director

DR. LALITHA PRAJNA, MD, DNB

### Medical Director Designee

DR. MANORANJAN DAS, DNB

### Manager

D. SARAVANAN, MSW, M.PHIL, MBA (HR)  
PGDC

## ROTARY ARAVIND EYE BANK, TIRUNELVELI

### Medical Director

DR. R. RAMAKRISHNAN, MS, DO

### Medical Director Designee

DR. V. ANITHA, DNB, FAICO

## ARAVIND-IOB EYE BANK, COIMBATORE

### Medical Director

DR. V. NARENDHAN, DO, DNB

### Medical Director Designee

DR. ANITHA RAGHAVAN, DO, FRCS (G)

## ARAVIND EYE BANK ASSOCIATION OF PONDICHERRY

### Medical Director

DR. N. SHIVANANDA, MS

### Medical Director Designee

DR. V. RAJESH, MS

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## Lions Aravind Institute of Community Ophthalmology

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R. SURESH KUMAR, MA, PGDHM

SANIL JOSEPH, MHA, M.SC

DHIVYA RAMASAMY, MBA

MOHAMMAD GOWTH, MA, PGDHM

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A. SYED ALI, MA

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G. KRISHNA VENI, M.Sc

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### Scientist

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## BIOINFORMATICS

### Scientist

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## PATHOLOGIST

DR. R. SHANTHI, MD

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### Division Manager-Surgical Blade

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V. SWETHA, MBA

### Manager-IT & Systems

K.R. SANKAR, M.Sc

### Production Supervisor

L. LINGAMMAL





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UDUMALPET - 112, Dhalli Road, Opp. Palaniandavar Mills, Udumalpet 642 126, Tamil Nadu, India. Phone: (04252) 260 400  
COIMBATORE CITY CENTRE - Cowly Brown Road, R.S. Puram, Coimbatore 641 002, Tamil Nadu, India. Phone: (0422) 254 0400  
KOVILPATTI - 4/897, New Appaneri, Padmavathi Garden, Thiruvankadam Main Road, G.V.N. College (PO),  
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